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OMAHA
HUNGER
MALNU-
TRITION
STARVATION
The Paradoxical Problem of Modern Times
Hunger and starvation have stalked the footsteps of man since the dawn of history. Only in the bloom of modern science in the last half century has there for the first time come hope that these gaunt specters could be vanished *if man but willed to do so.* (Italics ours). — *Science, May 23, 1947.*
More than 150 years ago, Lavoisier, recognized father of science in nutrition, and the plant and animal pathologists of the nineteenth century, provided the knowledge required to escape the hazards of undernourishment. Yet, the question of whether the world can produce enough to feed its inhabitants remains widely debated.
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Combating Brucellosis in Cattle in Norway

Veterinary Inspector H. BAGGERUD
Oslo, Norway

AS INQUIRIES have been received from different quarters in Great Britain and the United States in respect to the publication of a survey of the methods adopted and the results attained in the combating of brucellosis in Norway, this is a brief account thereof, based upon records of the veterinary directorate. I hereby convey my thanks to Veterinary Director-General L. Slagsvold for permission to use the material.

The first official regulations respecting contagious abortion in Norway were issued in 1903, or seven years after Professor Bang, in 1896, had demonstrated that the *Brucella abortus* Bang was the cause of the disease.

These first regulations prescribed that the owners of livestock should report the disease to a veterinary officer or to the police, and it was forbidden to send cattle assumed to be affected with brucellosis to cattle markets or shows, or to the pastures or cowsheds of other stockowners. It was, however, permitted that such animals be sold for slaughter.

One of the greatest difficulties in combating infectious diseases in Norway is the existence of the common pastures. As Norway is a mountainous country, only a comparatively small area is under cultivation. In the uncultured regions, however, there are large tracts of land which in summer afford excellent pasture for cattle, horses, sheep, and goats.

Since the comparatively small area of arable land must be utilized for the production of grain, roots, and hay, we find many places, especially in the Westland, where there is no pasture for the livestock at home on the farm. If any of the arable land should be used for pasture, the farmer would have to be content with a considerably smaller number of livestock. For centuries it has, therefore, been customary to drive the stock to the mountains in the summer to graze upon the broad ranges of grassland that would otherwise lie unutilized. In these highlands, a byre and a small dwellinghouse are erected. Here the cattle graze for about three months. They are brought into the shed every evening and let out the next morning after milking. The grass is so nutritious that the yield of milk is well maintained by merely giving them salt.

These mountain pastures are used in common by a large number of farms, which from immemorial times have had the right of pasturage there, and, therefore, animals may be assembled from 20, 30, or 40, indeed, sometimes from 70 or 80 different herds. What this implies as regards the diffusion of an infectious disease may easily be imagined. A single case of contagious abortion may lead to infection of all the herds on the common pasture. This digression is necessary in order to explain why so much importance is assigned to this problem in our regulation.

Veterinary Inspector Baggerud (RCVS-COP '30) became chief of the Brucellosis Division (1934), Ministry of Agriculture, Norway, and in addition, leader of the Government Institute for Mastitis Research (1940-1946). In 1946, he became a veterinary inspector, chief of Contagious Diseases Department, Veterinary Directorate General, Ministry of Agriculture. A veterinary inspector in Norway is chief of a department and is second only to the Veterinary Director General and the Deputy Director General.

In the years since 1930, Norwegian agriculture has labored under great difficulties. The depression that followed the first world war disorganized the market for agricultural products, and the farming industry as a whole was faced by the danger of collapse and ruin. The government was compelled to come to the support of the farmers and to initiate various measures to alleviate their difficulties in the critical situation. One of these measures was to combat brucellosis, which for many years had occasioned the heaviest losses to Norwegian agriculture. We have no official records to show how great the loss was in Norway, but if we take as a basis the English calculations, according to which we must reckon with an annual loss of 10£ per animal, we arrive at a loss of between 2 and 3 million kroner. For comparison, it may be mentioned that, according to statistics from the International Bureau for Epizoötic Diseases, Germany had a loss of 200 million marks per year, Switzerland 90 million francs, Holland 4½ million gulden, Austria 8 million schillings, Estonia 2 million kroner, and the U.S.A. 175 million dollars.

On the initiative of Veterinary Director-General Thorshaug, and the former minister for agriculture, Mr. Five, the Department of Agriculture recommended that the Storting should make an annual grant of 250,000 kroner for the combating of the disease. A proposal to this effect was passed on June 28, 1934. The Veterinary Director-General at once proceeded to work out a detailed plan of operations for this purpose. This was a daring experiment, Norway being the first country in the world to adopt a really rational procedure for fighting the disease on such a large scale. The United States at about the same time began to take similar measures, but these were not known in Norway before Director Thorshaug's plan had been put into operation. Thorshaug's method was based upon the principle of voluntary collaboration and its aims were:

1) To prevent the spread of infection.

2) To eradicate the disease from infected herds.

In order to accomplish the first objective, it was necessary to obtain a survey of all infected herds and then to isolate these herds to prevent a diffusion of the disease. Regulations were set forth in a circular from the Department of Agriculture, dated Nov. 28, 1934, and read as follows:

1) As soon as there arises a probability that a herd has contagious abortion, the disease caused by *Brucella abortus* Bang, the owner thereof, or the person who on his behalf has charge of the animals, is ordered to report the fact to a veterinary officer, a superintendent of police, or a sheriff. By probability of contagious abortion is understood a cow that has cast her calf (premature calving).

Under this regulation, *all cases* of premature calving must be reported. In this way the infected herds are located.

2) When it has been established by serological, bacteriological, or other examination that an animal in a herd of cattle has contagious abortion disease, the whole herd is to be regarded as infected. The same is true when it has been proved that an animal in the herd has been exposed to infection.

Thus, we see that when the disease is detected in a herd, or when 1 animal has been exposed to infection, all the animals therein become subject to the regulations applying to infected cattle. This prevents the sale of cows for milking or breeding purposes, the lending of bulls, etc., until the necessary blood samples have been taken and it has been ascertained whether the herd is really infected. In practice, we instruct the local veterinary officer to keep the herd under observation and to prohibit the owner from selling cows for milking or breeding, from using common or other pastures, and from lending bulls. Should the owner refuse to comply with these injunctions, the herd would be declared infected, but it has never been necessary to proceed to such measures.

3) The owner of a Brucella-infected herd—and persons acting on his behalf—must comply with the injunctions of the local veterinary officer with respect to isolation and disinfection. It is forbidden to put other animals into sheds that have been used for cattle infected by brucellosis until disinfection has been effected.

Thus the regulation gives the veterinary officers authority to prescribe satisfactory isolation and disinfection, and it aims at preventing infection of healthy animals through being placed in infected sheds.

4) It is incumbent upon every person who has to do with cattle infected by brucellosis to exercise the necessary caution with respect to footwear, working clothes, and hands, so that the infection shall not be diffused. Inspectors' assistants who are alternately coming into contact with infected and healthy herds are obliged to take special precautions. The same

applies to butchers, when they have slaughtered infected cattle.

Cast fetus, after births, uterine discharge, and infection-carrying organs shall be burned or buried in an effective manner.

This regulation applies, of course, also to veterinary surgeons who are dealing with infected herds. Before these regulations came into force, we had examples of infection being conveyed by veterinarians, and there are now several places in Norway where the veterinary surgeon has the farmer provide a set of rubber overalls and a pair of rubber boots, which lie ready for the surgeon to put on before going into the byre or cowshed. We have also had cases where infection was conveyed by quacks, who were afterwards prosecuted and fined.

5) With the exceptions mentioned in regulation 10, it is forbidden to remove from the farm animals belonging to a herd infected by brucellosis, unless they are taken to a safely isolated place, where they are to be slaughtered immediately after arrival. The veterinary director-general can grant dispensation from this regulation.

When animals are to be removed for slaughter, notification must be given to the district veterinary officer on the form issued for that purpose (brucellosis form No. 5). Reacting animals which are to be sent for slaughter shall be marked in the manner prescribed by the veterinary director. The transporting or driving of such animals shall take place in such manner as will prevent the spread of infection. The animals shall be slaughtered at latest within a fortnight after removal from the farm.

This regulation prevents the sale of animals for milking or breeding purposes, participation in cattle fairs or shows, transfer of animals from one herd to another, etc., unless dispensation is granted by the veterinary director-general. The district veterinary officer shall be informed beforehand as to date of removal of the animals for slaughter in order that he may instruct the station master, shipping master, slaughterhouse, etc., concerned to have the means of transport disinfected. As a further precaution the animals are marked with a circular hole, 2 cm. in diameter, in the left ear before removal. This prevents the sale of the animals, except for slaughter, and ensures disinfection of the means of conveyance, as prescribed by regulation 6. Trucks or lorries shall be disinfected in the slaughterhouses.

6) After transportation of animals infected by brucellosis, the means of conveyance employed (railroad wagons, ships, automobiles, etc.), as well as the stabling places used during transport and all cases, buckets etc., shall be disinfected as soon as possible—and at all events before being used again.

7) If animals which have been removed for slaughter are found to be still alive after the time mentioned in regulation 5, it may be demanded that they shall, within a time limit fixed by the veterinary director-general, be slaughtered at the expense of the owner,—if necessary, by the public authorities.

8) It is forbidden to employ bulls from infected herds for serving cows from healthy herds. Pedigreed bulls provided by the state or by breeding societies are regarded as belonging to the herd with which they are stationed. It is likewise forbidden to allow cows from an infected herd to be served by a bull from a healthy herd.

Strange to say, it was actually necessary to impose this regulation, since some of the farmers were very careless with respect to the use of bulls.

9) It is forbidden to send animals from infected herds to another man's pasture. Everyone who rents pasturage for cattle or who receives on the mountain farms ("seters") cattle from different owners, as well as stock owners or others who collect cattle from different herds on common grazing lands, must be certain that the animals come from noninfected herds, and in case of doubt they shall apply for information on the subject to the local district veterinary officer. It is likewise forbidden to take animals from healthy herds to pastures occupied by infected herds.

By "another man's pasture" is understood grazing land on which the farmer in question has not the right of pasturage. This regulation precludes him from renting pasture for his cattle or letting them graze on another man's land, even if the latter has given his consent.

A number of farmers who have more grassland than they need sometimes rent out pasturage for several other herds, and likewise some owners of "seters" take one or more other herds (usually small herds) to their "seters," either against cash payment or a share of the yield. In accordance with this regulation, such persons must now make sure that the animals thus taken are not infected.

10) It is forbidden to put animals from abortion-infected herds on common pastures, unless permission to do so has in each individual case been granted by the veterinary director-general. Application for such permission shall

be sent in through the local district veterinary officer.

The above prohibition does not embrace:

a) Female calves and nonpregnant heifers under 1 year old.

b) Male calves that will not be more than 6 months old at the end of the grazing period.

c) Cows and heifers more than 1 year old which are not pregnant and which show a negative blood test.

d) Furthermore, it is permitted to take bulls over 6 months old which show a negative blood test immediately before being sent to the pasture, provided that they are at all times kept either fastened up in the byre or tethered within a secure fence.

This is one of the most important regulations. These common pastures have beyond all doubt played the main rôle in the spreading of the disease in our country. During the campaign against the disease, the common pastures were found to be responsible for 85 per cent of the infection that occurred, but the spread of the disease after these regulations came into force has been insignificant.

Because of the great economic consequences involved, general permission was granted to send to the common pastures calves, heifers, and nonpregnant cows which showed negative reaction immediately before being removed. But especially in 1935, we were obliged to give dispensation also for the pregnant cows in a large number of herds. Dispensation was given on the condition that the animals showed negative reaction at a test made in the last four or five weeks before removal and that the owner—or the herdsman—undertook to keep a close watch upon the animals and to isolate any of them that might show premonitory symptoms of abortion. Each individual owner was obliged to apply separately for dispensation, and the records concerning each particular herd were closely scrutinized. On the basis of the information and data we possessed, especially regarding the duration of the infection, the activity of the disease in the herd, the age of the animals, and the date of service, it was decided in each separate case whether dispensation should be given or not. Even though we cannot in this manner entirely exclude the possibility of cases of abortion in the herds which got dispensation, yet the results proved to be surprisingly good. Unfortunately, I have not had an opportunity of working through the material from the whole country, but I can cite a few figures from one of our veterinary districts in which the disease was most prevalent. In 1935, dispensation was given for 95 herds and refused for 48 herds. Among the 95 herds, 1 case of abortion occurred during the time of pasturage, and this animal showed negative reaction at three successive tests over a period of nine months. Among the 48 herds which were not sent to the common pastures, abortions occurred in eight herds, all of which had positive reaction. Owners were not permitted to send bulls from infected herds.

11) The owner of a herd infected by brucellosis must provide a secure fence for the land used for home pasturage. It is forbidden to let out on the pastures herds which are infected by the abortion disease and are found by experience to be difficult to keep within the fences erected.

12) The driving of infected cattle to and from the pastures shall proceed in such manner that the animals do not come in contact with healthy herds and do not get access to strange byres or the like. Besides, it is forbidden to drive animals with infectious uterine discharge to and from the pastures, if the road is wholly or partly used by animals from noninfected herds.

13) When cattle are to be sold at auction or from droves for milking or breeding purposes, it must be established that the animals are free from contagious abortion. The district veterinary surgeon shall be informed in due time before the auction is to be held or the sale from drove is to begin, and if he finds it necessary a blood test shall be made in order to ascertain that the animals are free from reaction.

This is the first of the four regulations which aim to prevent spread of infection through marketing by bringing under control those forms of selling which have been found by experience to be the most harmful in this respect, namely, sale by auction, from droves, and from saleyards. At auctions, the animals are usually sold separately and will, therefore, enter a large number of herds. The expression "sale from droves" covers a very old form of marketing and the name originates from the fact that the animals are driven from place to place. In the spring and summer, drovers go around from farm to farm and buy up cows. In the autumn, the animals are assembled and are again driven along the roads from place to place. A drove may number from 10 to 100 cows, and the drovers sell the animals as they pass from

one district to another. At night, they hire pasture for the animals, and if an infected cow casts her calf on these pastures or along the road, all the others generally come and lick the fetus, with the result that almost the whole drove becomes infected. To guard against the danger of having infected animals in the droves, the following regulations were necessary:

14) The owner of cattle which are to be moved or sold from droves is obliged to notify the veterinary officer of the district from which the cattle are to be driven, at least fourteen days before starting, as to how many animals the drove shall comprise, the date of beginning the movement, and the route to be followed.

15) It is forbidden to assemble cattle droves unless the animals are provided with a mark prescribed by the veterinary director and accompanied by a certificate (brucellosis form 1 A) stating that the animals come from herds that are free from contagious abortion, or by certificate B, stating that blood tests have given negative reaction. The district veterinary officer in the districts through which the droves are to pass has authority to ascertain that the regulations have been complied with.

On receiving such notification from the owner of the drove, the district veterinary officer concerned sends a report to the veterinary director-general, who then notifies all district veterinary officers along the route the drove is to follow. These officials can then attend and ascertain whether the certificates are in order.

The certificate issued by a veterinary surgeon is evidence that the animal concerned is regarded as being free from the disease. We have two forms of such certificates. In certificates A, printed on blue paper, the owner declares that the animal comes from his herd and that the said herd is free from the abortion disease. The veterinary surgeon who issues the certificate testifies that from his knowledge of the herd the statement is correct. In certificate B, printed on white paper, the veterinary surgeon states that on the date recorded, the animal showed negative reaction to the blood test. The animal is identified with a metal disc in the ear. This disc bears the letter K.C. and a number, which number is also entered on the certificate. The veterinary directorate keeps a list of the series of numbers supplied to each individual veterinary surgeon, and the latter keeps a list of the eartags he delivers. In this manner, it is an easy matter to identify an animal when we have its eartag number.

16) Cattle which are brought to saleyards, market places, show grounds, or to other places where cattle are assembled for sale, shall be accompanied by certificate A or B (*see* regulation 15). Cattle may, however, be placed in saleyards in a separate enclosure to be sold for milking or breeding purposes without being accompanied by either of the said certificates, provided that, before being sold, they are subjected to the blood test for contagious abortion on conditions prescribed by the Department of Agriculture.

Dispensation from these provisions may be granted by the Department of Agriculture, when the said places are situated in districts in which contagious abortion does not occur and when only animals from abortion-free districts are assembled or sold. Precise rules respecting the taking of blood samples, payment of fees, etc. are laid down by the Department of Agriculture.

Marketing in saleyards means the sale of cattle for milking or breeding purposes at the slaughterhouses in the larger towns. The regulation also demands certificates at cattle fairs or shows, and the expression "other places" refers to the more casual selling which is common among cattle dealers all over the country. The ordinary sales from man to man are not affected by the provision respecting certificates, because we realized the impossibility of any effective control in this respect and did not wish to make regulations that might come to exist only on paper.

17) The above regulations shall come into force on Jan. 1, 1935.

18) Penalties can be imposed for infringement of these regulations.

The civil veterinary service in Norway is under the superintendence of the Ministry of Agriculture. Under the Department of Agriculture stands the veterinary directorate, at the head of which is the veterinary director-general, who is the chief authority in veterinary matters. The country is divided into about 165 veterinary districts, each of which has its district veterinary officer, appointed and for the most part paid by the state. The duties of the district veterinary officers are to carry out all official transactions, to keep the different registers, and sometimes also to do service outside their districts,—for example, in the combating of malignant infectious diseases. The fact that we have

a number of state-appointed veterinarians throughout the country has proved to be a very important factor in the battle against infectious diseases of livestock, and it may be doubted whether we would have been so well situated as we are today with respect to bovine tuberculosis, foot-and-mouth disease, and brucellosis if we had not had our district veterinary service.

When brucellosis is detected in a herd of cattle, the veterinary surgeon concerned sends a report thereof to the veterinary directorate. The report is sent through the district veterinary officer, who enters the herd in his official register. The veterinary director-general then declares the herd to be Brucella-infected, and the district veterinary officer notifies the owner to that effect, sending him at the same time a copy of the regulations. If the owner wishes to proceed to combat the disease, he first applies to have his herd subjected to blood tests at the public expense. When taking the samples of blood, the veterinarian also notes the age of the animals. Together with the blood samples, there is sent in a blood test schedule in duplicate, with particulars respecting the animals, their age, date of breeding and of calving, etc. The blood samples are tested at the veterinary institute which returns one of the schedules to the veterinary director-general, with a copy of the report regarding the result of the examination. When the veterinarian receives the report of the result, he proceeds at the public expense to visit the farm, where he identifies the reacting animals by perforating the left ear, gives instructions for the isolation of the reacting animals, and arranges for the disinfection of the byre. The owner is then usually given written instructions as to how the disinfection is to be effected and as to what alterations and repairs he must make, and he gives a receipt for these instructions. At the same time, he signs an application for state compensation for the slaughter of the reacting animals.

As compensation for slaughtering, the state grants Kr. 300 ($60.) per animal aged between 1½ and 12 years, Kr. 225 ($45.) per animal over 12 years old, Kr. 180 ($36.) per animal between 6 months and 1½ years old, and Kr. 90 ($18.) per animal under 6 months old. When the application is granted, the reacting animals are slaughtered as soon as possible and at latest within three weeks after the test was made. When the disinfection is completed, the veterinary officer proceeds at the public expense to visit the farm to see if the disinfection is satisfactory. The owner then applies for another blood test at the expense of the state. On the document granting this application, the veterinary directorate enters the date for carrying out the new test. If the test again gives a positive result, the above described procedure is repeated. If the result is negative, the blood tests are continued at cost of the state until the herd can be released from control.

Originally, the herds were released when they had had at least two negative blood tests, made at least three months and six months after the last positive reaction. We now usually demand three negative tests at intervals of at least three months, making altogether nine months from the last positive reaction, before we release an infected herd from control. The herd is released by the district veterinary officer after the consent of the veterinary director-general has been obtained.

The veterinary directorate keeps a register of the infected herds. We employ the cardex system, which has proved to be very satisfactory. When the work of combating the disease was started, we had reckoned that it would take some time before it was in full swing, but the interest proved to be far greater than we had hoped for. This created certain difficulties. In the first place, the veterinary directorate was so completely inundated by reports, applications, and inquiries that we had the greatest difficulty in keeping the program going. Owing to the uncertainty that prevailed respecting the diffusion of the disease, it was necessary to make a large number of blood tests in order to get a general idea of the situation, with the result that the veterinary institute was overwhelmed with work. Therefore, we rationed the distribution of test tubes. As a result, the farmers almost worried the life out of the veterinary surgeons, because the blood samples could not be taken quickly enough. Happily, this situation was soon rectified, and the efforts to combat the disease have been greeted with great favor.

As already mentioned several times, our greatest difficulties arose from the common pastures. In the first years, we had cases of abortion on the common pastures every summer, in spite of the greatest caution being exercised. Fortunately, the number of such cases decreased every year, and in the last few years none has been recorded.

Animals infected *per os* on these pastures usually abort in the course of the autumn and winter, so that these herds are as a rule brought under control by spring. Meanwhile, there are always some bulls grazing on the common pastures, and these sometimes spread the infection through copulation. The cows infected in this manner do not abort, as a rule, until April, May, or June, and sometimes even later. Indeed, we think we may claim to have seen cases where the animals did not abort until the next period of pregnancy.

Another difficulty is presented by recurrences in herds previously released from control. These have luckily been far less frequent than

we had dared to hope. By Jan. 1, 1947, we had 184 previously released herds in which the disease had cropped up again. The distribution of these herds is shown in table 2. Some of such cases had undoubtedly been exposed to outside infection, so that we must reckon with the possibility that they had simply been reinfected. I can mention an example hereof. Nine farms in the Westland had common pasturage. Seven of these herds had had cases of abortion, but had afterwards been released from control. The eighth herd gave negative reaction to the blood test and was regarded as free from the disease. A cow from this herd aborted on the pasturage, showed positive reaction, and by the end of February there had occurred abortion or positive reaction in five of the other herds. I should suppose that in over half of these 184 herds there were actual recurrences, which represents between 2 and 3 per cent of the herds hitherto released. Some of these recurrences come in the first half year after the herd has been released, and they are probably due to defective disinfection or to an animal having been infected without showing positive reaction.

That an animal becomes infected without giving positive reaction is a comparatively rare phenomenon in herds in which the infection has been present for a rather long time, unless it is then a question of recrudescence of the disease. In these cases, the disease presents itself in about the same manner as in newly infected herds.

In newly infected herds, a cow frequently aborts without showing positive reaction at a test made immediately after the abortion, but then reacts positively at a test from four to six weeks later. Owing to this circumstance, the combating of the disease is generally more difficult in a newly infected herd than in a herd that has long been infected. We have experimented with more frequent tests in such herds, but it seems that we cannot entirely prevent these cases of abortion and we have, therefore, confined ourselves to an examination every third month, as we have not noted demonstrably better results on employment of more frequent tests.

We have also, in some cases, met with animals which show varying reactions. At one test the reaction is positive, at the next negative, at the next, again, perhaps suspicious, and then comes once more a positive reaction. We presumed that these animals had a store of bacteria either in the udder or in a lymph gland, and that these bacteria occasioned a varying production of antibodies. Many of these animals do not seem to be spreaders of infection, but nevertheless we slaughter them in order to be on the safe side.

We have also had several examples of the fact that animals may retain for years the property of positive reaction. I shall here mention a case in point. While making a general blood test survey in the Westland, a veterinarian examined all the animals in a district which had no means of communication with the outer world except by boat, as it was surrounded on all sides by impassable mountains. In this district there had never, so far as was known, occurred any case of abortion, and no animals had been landed there for the past six years. A 10-year-old animal reacted positively, and the owner stated that he had bought it from a neighbor. I happened to be on a tour of inspection and was present when the veterinary officer received the result of the blood test. He was simply astounded at the result and thought that it must be a case of false reaction. I asked him to take a fresh sample from the animal and at the same time to make inquiries of the neighbor as to whether the cow was bred from his own stock. It then

TABLE I—The Results Attained in Infected Herds

	Total infected herds.	Herds with reactors at last test.		Herds negative at last test.		Herds in which disease was deemed to be eradicated at given date.	
Jan. 1	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
1936 (Beginning of eradication program)	2,278	855	37.53	787	34.55	636	27.92
1937	2,741	321	11.70	347	12.70	2,073	75.60
1938	2,886	142	4.92	96	3.33	2,648	91.75
1939	2,992	110	3.68	32	1.07	2,850	95.25
1940	3,076	70	2.28	31	1.01	2,975	96.71
1941	3,115	26	0.83	12	0.39	3,077	98.78
1942	3,130	21	0.67	7	0.22	3,102	99.11
1943	3,143	15	0.48	6	0.19	3,122	99.33
1944	3,152	7	0.22	8	0.25	3,137	99.53
1945	3,168	15	0.47	4	0.13	3,149	99.40
1946	3,178	7	0.22	3	0.09	3,168	99.69
1947	3,186	8	0.25	1	0.03	3,177	99.72

turned out that the neighbor had bought the cow from an abortion-infected herd eight years before. The new blood sample likewise gave positive reaction. False reaction seems to be a rare occurrence. Among the blood samples—amounting to about 400,000—which have been examined during the campaign, there are not more than ten or twelve which may be supposed to have given positive reaction when the infected herd in a district otherwise free from the disease. We have then, as a rule, given the owner half of the usual compensation for the nonreacting animals on condition that he allowed the whole herd to be slaughtered. In these cases, the byre had been disinfected and then allowed to stand empty for three months before being used for a new herd. This seems to have been an entirely effective method, as we

TABLE 2—"Recurrences" and Newly Infected Herds

	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	Total
Newly infected herds	463	145	108	84	39	15	13	9	16	10	8	908
Recurrences	36	47	38	32	3	8	5	3	9	3	0	184
Total accessions	499	192	144	116	42	23	18	12	25	13	8	1,092

animal was not infected. With one single exception, the animals in all these cases were suffering from a febrile affection, either traumatic indigestion or septic metritis.

Another form or recurrence appears one, two, or three years after the herd has been released from control. In these cases, it seems to be a question of animals which were calves or young heifers during the active abortion period in the herd. They had been infected when young, but had not shown positive reaction. When they later became pregnant, some of them aborted or had an apparently normal calving, but spread masses of infective matter in the amnionic fluid. I can mention an example. In one herd, 15 out of 30 animals reacted positively in March and June, 1935. The reacting animals were slaughtered and on retesting in December, 1935, and November, 1936, the herd was found free from reaction. No new animals had been bought since the autumn of 1935. A heifer from the original herd, born in an apparently normal manner in June, 1935, had a calf in April, 1938. In the summer of the same year, the herd was tested with the result that 30 out of 42 animals showed positive reaction, and several of these aborted immediately after being tested. The heifer mentioned was the only animal that showed positive reaction among those coming from the original herd. Two pregnant cows from another herd that had never had abortion were stabled in the byre for fourteen days. While these latter were still in the byre, the above mentioned heifer calved, the other 2 animals became infected, and they aborted in May, 1938, being the only reacting animals in the herd. The origin of the infection was quite inexplicable until the disease was detected in the other herd.

In some few cases, we have proceeded to slaughter an entire herd. This was done either in cases where almost the whole herd showed reaction or where we were left with one single have had only 1 new case of abortion on such a farm, and this we think was due to the owner having bought an infected animal. He had bought a cow from one of his neighbors and this animal aborted, being the only reacting animal in the herd. We then made a blood test in the neighbor's herd, with the result that all the animals showed positive reaction.

Also in all other cases, we usually demand that the byre shall remain empty throughout the summer. The animals are then out on the pastures, and if no case of abortion occurs we may reckon that no infection has taken place during this time. At the examination in the autumn, we have good hope of detecting those that may have been infected before the animals were again returned to the disinfected byre. We have in some cases tried the effect of isolating the reactors instead of slaughtering them, but we have had decidedly less favorable results from this mode of procedure. We have likewise tried the results of introducing new stock. As a rule, the purchase of new stock is not allowed until the herd is released from control. We have sometimes permitted the purchase of new animals on the condition they be placed in a separate isolated enclosure, and sometimes we have allowed particular owners to introduce new animals after one negative test, but in both cases the results proved to be unsatisfactory. We have, therefore, decided to keep to the usual arrangement.

As will be seen from table 1, the work of combating the disease made rapid progress in the first years. After three years, the prevalence of the disease had been reduced by over 90 per cent and after six years by over 98 per cent. Meanwhile, the Germans attacked Norway on Apr. 9, 1940, and after two months of fighting they had occupied the whole country. In order to provision their military forces, they began in the autumn of 1940 to import living ani-

mals from Denmark, without its being possible for the Norwegian veterinary authorities to get permission to exercise any really effective control of the imported animals. This resulted, among other things, in a serious outbreak of foot-and-mouth disease in the winter of 1940-1941. Many animals imported from Denmark were infected by brucellosis, and as they were stabled in the German encampments all over the country and sometimes also forced in upon the farms in the vicinity thereof, it was obviously impossible to avoid some spreading of infection. Moreover, it became difficult to buy cattle for milking and breeding purposes on account of the enforced slaughtering in connection with German requisitions of meat. Owing to the critical food situation, it was also difficult for the farmers themselves to do without milk. Consequently, the measures for combating the disease could not be pursued so effectively as desired during the war years. We were obliged to postpone the slaughtering of reacting animals. Owing to all these circumstances, the whole work was delayed. Indeed, in 1944 there was actually noted a slight increase in the number of infected herds. Meanwhile, the methods and regulations for combating the disease proved to be sufficiently effective to prevent any appreciable spread of infection, and at the beginning of the year 1947, 99.72 per cent of the herds had been released from control. There remained only nine infected herds in the whole country. We could, of course, have proceeded to slaughter these herds at once, but as we have, right up to the present time, occasionally met with cases of infection originating from the German importation, we have found it most correct to continue to follow the original plan. With the effective regulations we have in our country, the danger of diffusion of the disease from the infected herds is very small.

When the work of combating the disease began, 14 of the 20 counties into which the land is divided were found to be infected. Ten of these are now free from the disease, and in most of them it has not occurred for several years. The four counties in which the disease still exists have respectively one, one, two, and five infected herds.

With respect to the cost of the work of combating the disease, it may be mentioned that up to Jan. 1, 1947, there have been spent altogether about 2,200,000 kroner (about $440,000). Of this amount, the farmers have received about 1,700,000 kroner (about $340,000). Traveling expenses and fees to veterinarians have amounted to approximately 380,000 kroner (about $76,000), while the rest has gone to meet the costs of administration. The whole campaign has cost less than the disease had previously been costing the country annually.

Brucellosis in the U.S.A.

State departments of health reported about 4,000 human cases of brucellosis last year but, says the *Journal of the American Medical Association* (editorial, June 28, 1947), "projection of the results of detailed studies indicates that there were 30,000 to 40,000 cases." "The need," the editor continues, "is for a method of laboratory and clinical diagnosis of the milder cases and also *methods of control of brucellosis in animals* (our italics) and an effective therapeutic agent."

That, in a few words, writes another major public health problem on the agendum of veterinary medicine not only from the standpoint of the transmitted infection but also because of the loss of badly needed food. In effect, the editorial tells the veterinary service to go forth and do its duty against Brucella infections and, in that respect, is a happy contrast to the lack of encouragement the veterinary profession received when it had to swing into action against bovine tuberculosis, unaided by a public health issue, some forty years ago. There is but to agree on a uniform plan and stop confusing the public with the eponymic terminology—Bang's disease.

Sixty Million Goats.—India has a total of 60 million dual-purpose goats, principally of two breeds, Jamma Pari and Beetal. The former averages 540 lb. of milk per lactation period, with a butterfat value of 5.2 per cent, and the latter averages 356 lb. containing 4.5 butterfat. Another breed, the Kamori, yields 4 to 12 lb. of milk per day.

Hybrid corn, which cost about $10 million to develop, is returning an annual national dividend of $750 million.—*Univ. of Ill.*

The Mexican Outbreak of Foot-and-Mouth Disease.* VI.

Steady and increasing pressure is being brought to bear on the various centers of foot-and-mouth disease infection in Mexico by the combined Mexican-United States forces under the direction of the joint commission representing the two countries. Under date of July 3, 1947, a USDA release reported that the disease had apparently been eradicated from isolated northern points that represented two of the furthest advances of the infection toward the U. S. border. These northerly centers were small areas of infection in the central Mexican states of Zacatecas and Aguascalientes (*see* map), about 300 miles from the border. The plan of attack is the encirclement of all disease areas and concentration of eradication efforts on outlying points first.

The gains mentioned were offset to some extent by a slight increase in size of the main quarantined area, principally in southern Vera Cruz, and a few other outbreaks centered principally in San Luis Potosi, Jalisco, and Chiapas. Precise determination of the outer boundaries of areas of infection throughout Mexico still awaits completion of field surveys by experienced veterinarians, the release stated.

Slaughter operations for all Mexican states up to the end of June were estimated at 168,400 cattle and about 68,000 sheep, goats, and swine. The average indemnity paid by the United States for about 29,000 cattle appraised for slaughter from April 10 to May 31, 1947, was 238 pesos or about $49 in U. S. currency.

Infection pockets outside of the main area of massive infection that are yet to be eliminated are found in the south-central Mexican States of Jalisco, Michoacan, Guanajuato, and Queretaro. These areas are now receiving the greatest attention of the eradication forces.

The main area of infection, which continues to be under strict quarantine and in which eradication operations have been going on although with less intensity than in the outlying areas, is located in the states of Veracruz, Hidalgo, Mexico, Morelos, Puebla, Tlaxcala, Oaxaca, Queretaro, Guerrero, and the Federal District. The only break in the containing lines of the main infected area was a spread of the disease to the southern part of Veracruz.

An indication of the extent of foot-and-mouth disease in states that include quarantined areas is provided by reports of the number of municipalities containing infection in each state. These figures, compiled June 20, are: Aguascalientes, 4; Chiapas, 3; Federal District, 13; Guanajuato, 10; Guerrero, 4; Hidalgo, 43; Jalisco, 2; Mexico, 40; Michoacan, 7; Morelos, 25; Oaxaca, 2; Puebla, 40; Queretaro, 2; San Luis Potosi, 1; Tlaxcala, 28; Veracruz, 110; Zacatecas, 1—a total of 335 municipalities distributed among 15 states and the Federal District. Municipalities are of approximately equal area and correspond roughly to counties in the United States.

(See map on opposite page.)

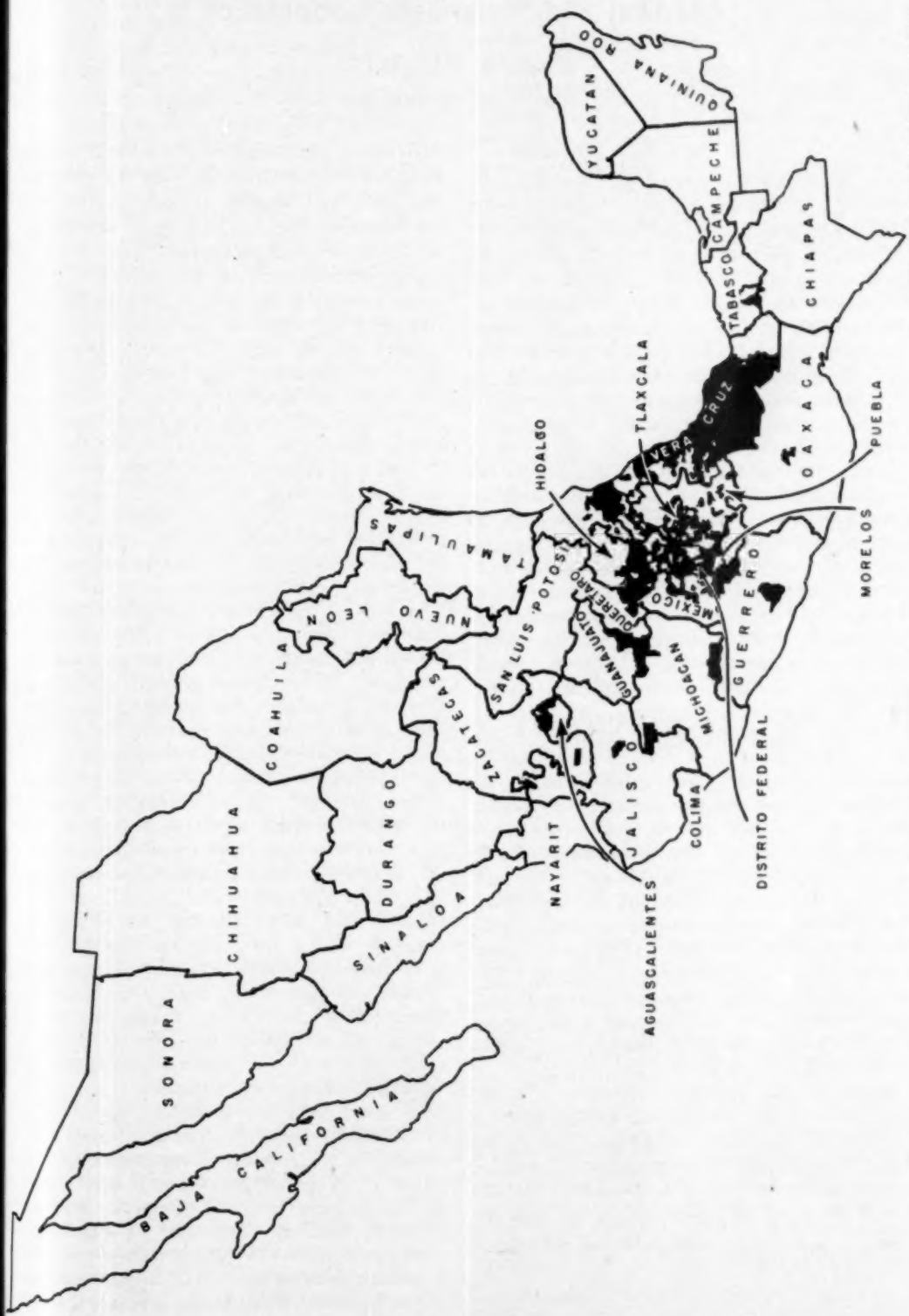
*See previous issues of the JOURNAL, beginning with the March number, for earlier summaries of the foot-and-mouth disease situation in Mexico.

More U. S. Veterinarians Assigned to Mexico

At time of going to press, about 75 veterinarians from the United States had been sent to Mexico by the Bureau of Animal Industry; this number is expected to reach 150 in succeeding months. Additional sanitary technicians and other lay personnel are also to be assigned to the eradication forces.

Congressional Committee Visits Mexico

Early in July, a group of United States senators and congressmen, headed by Representative (Dr.) George W. Gillie of Indiana, chairman of the House agricultural subcommitee on foot-and-mouth disease, flew to Mexico to make first hand observations on the eradication operations and report back to Congress on the progress of the work. Congress had already provided an additional $5,000,000 as the United States' contribution to continue the joint campaign until recommendations could be made as to the probable amount that may be needed for the balance of the year. The sum required may be about $50,000,000.



Areas Infected with Foot-and-Mouth Disease in Mexico, June 1, 1947.

—*Bureau of Animal Industry, USDA.*

Medical and Veterinary Cooperation

LOUIS A. BUIE, M.D.
Rochester, Minnesota

DISEASE is one of the great tragedies of living things. It is one expression of a struggle incessantly carried on among different forms of life, without quarter or armistice. Infectious disease is merely a disagreeable instance of a widely prevalent tendency of all living creatures to avoid the necessity of building by their own efforts the materials which they require to survive. Whenever they find it possible to take advantage of the constructive labors of others, they follow that course.

Life, in a sense, is an endless chain of parasitism. That form of parasitism which we call "infection" is as old as animal and vegetable life. Swords and lances, high explosives, and all the modern engines of war have had less effect on the fate of nations than plague, typhus fever, cholera, yellow fever, malaria, typhoid fever, tuberculosis, smallpox, diphtheria, and pneumonia. Nations have crumbled under their onslaught.

The partial emergence of mankind from the dire effects of these conditions has been made possible by the advancement of science. The tremendous technical advances made in the science of medicine have greatly modified the nature of its practice, as well as all of its social and economic relationships. The practice of medicine, once limited almost entirely to the physician, now enjoys the participation of many other professions which are concerned with vital aspects of the medical problem. In many ways, the veterinarian must be a scientist far beyond the heights that must be reached by the physician.

Many of the bacterial diseases of animals may cause serious illness in human beings, and animals are susceptible to as many diseases as are human beings. Economic problems are not the only factors which demand that diseases of animals be controlled and eradicated whenever possible. There is no doubt that the economic loss to the livestock industry caused by preventable disease has been significant, but this problem cannot be considered to be as vital to man as the effect of those diseases which are communicable to him. Basically, the professional activities of veterinarians and physicians are the same. Both are concerned with the diagnosis and treatment of disease and its control and prevention. Probably the most important functions of your profession are the care of sick and injured animals, the protection of that livestock industry on which the life of our nation greatly depends, and the protection of human beings against those diseases which are peculiar to animals but which are communicable to man. Probably in the last instance we shall find the greatest opportunity for coöperation between the veterinary and the medical professions. It would be superfluous for me to discuss before this organization those conditions which are common to animals and which are communicable to man. In fact, it would transcend my capabilities. But I venture to say that many would manifest no little surprise should a complete list of these diseases be recited. One can scarcely believe that glanders, encephalitis, Malta fever [brucellosis], anthrax, tuberculosis, milk sickness, some parasitic diseases, swine erysipelas, psittacosis, cowpox, foot-and-mouth disease, plague, tularemia, rat-bite fever, infectious jaundice, Rocky Mountain spotted fever, and rabies —yes, all of these and probably many other diseases—fall into this category. In human beings, some diseases, such as rabies, occur very rarely in this age, because of scientific discovery and attainment. But when it strikes, what is more ghastly than rabies? A cursory review of a list such as has been given will dispel at once any thought that the activities of the veterinary physician are chiefly concerned with economic problems. His signal achievement in eradicating tuberculosis of cattle; his accomplishments in dealing with infec-

Read before the Minnesota Veterinary Medical Association, 50th Anniversary Banquet, Jan. 7, 1947, St. Paul.

Dr. Louis A. Buie is chief of the Division of Proctology, Mayo Clinic, Rochester, Minn., and president of the Minnesota State Medical Association.

tious equine encephalomyelitis; the service which he has rendered in practically eliminating glanders as a threat to the health of human beings; the fact that he has prevented undulant fever from becoming a major health problem by his supervision of the milk and meat supply; the fact that his coöperation with the medical profession and the splendid achievement of his specialists in the fields of pathology and bacteriology have made it possible to control many diseases of a parasitic nature; all of these accomplishments and many more reveal the heights which the practice of your profession has attained.

We are living in an age of research. There is no doubt that the progress of our entire civilization is based on the power of the human intellect. When the spark of genius appears in an individual, it should be given the greatest opportunity for development, so that its benefits may be extended. A new opinion may originate with a single individual, but the result which such an opinion may produce will depend on the opportunity given for development and its effect on the minds of those who are ready for its reception.

In veterinary medicine, materials have been collected which present a rich and an imposing appearance, but unless and until these materials can be brought to those who are interested in becoming members of your profession, your greatest ambitions cannot be attained. No doubt many men and women of your profession, desirous of establishing themselves satisfactorily in their work, have been diverted from their purpose by lack of opportunity for educational advancement. It is certain that many have failed to adopt this profession as their life work because of lack of educational facilities. Many have had to be contented with inferior training. Many of these last, nevertheless, have succeeded by dint of ceaseless labor in establishing themselves on a plane above reproach. Never in the history of your organization has there been a greater need or justification for educational expansion.

I know that your present requirements for a degree in veterinary medicine are two years of preveterinary training in a recognized university or college and four years in a veterinary college. I know that since the war, there has been a striking increase in the number of both men and women who wish to study veterinary medicine. I know that at Kansas State College 1 out of every 7 individuals who registered wished to study veterinary medicine, but because of lack of facilities in the various colleges, the number of students enrolled in veterinary medicine still shows little increase over that recorded before the war. I know that in 1945 there were ten veterinary colleges in the United States and two in Canada. Also, I know that since then, Illinois, Missouri, and California have established schools of veterinary medicine, but all this is insufficient. It appears that we may view with optimism the prospect of such an expansion in our own great state university. A similar development is clearly the responsibility of many institutions whose function is the advancement of the teaching of medical science. It ill behooves them to linger in the cloudy obscurity of ancient ideas and practices. Science and industry recognize the important rôle of highly trained, ethical, and independent members of the veterinary profession, and your colleagues in the medical profession are proud of your achievements.

Prestige Skips Out of the Corner Drugstore

Leo Nejeski, marketing counsel for a number of firms in the drug industry, took an unbiased look at the drugstore business and annotated his impressions for the May, 1947, *American Druggist*. Here, in part, is what he had to say:

> Competition for the consumer dollar is shifting and changing constantly. But retail druggists, in too many instances, are either living in the distant past or wishing that somebody would come along and buy them out. When the level of education was lower, and when doctors and dentists were scarce, a little skill and a little training in pharmacy won a lot of respect and respect meant steady customers and steady profits. Ask druggists where they fit into the scheme of things today and too many shake their heads in confusion. And not being sure, the fearful druggist tries to compete with [the veterinarian], the chain store, the grocer, the baker, and the candlestick maker, and loses prestige every time he does it.

The editorial insertion of "the veterinarian" belongs to the JOURNAL. The quotation is not complete without it.

The Role of Veterinary Medicine in Public Health

WM. F. LAMB, M. D.
Louisville, Kentucky

It is indeed a pleasure to have the opportunity of addressing the Southern Veterinary Association as fellow practitioners of the healing art, whether it be man or animal.

In this rapidly changing era, marked by kaleidoscopic developments of newer methods of warfare, housing, manufacture, and feeding, medical men of all branches of the profession are faced with a challenge heretofore unknown. Through scientific improvement of the airplane, travel to all parts of the world is possible in a matter of hours, and it naturally follows that we face not only diseases common to the United States but those existing in South America, the South Pacific, and the Orient as well. Increasing vigilance is necessary to prevent their introduction and spread in this country.

As a result, we of the medical profession are cognizant of the serious implications which may arise and, in our determination to prevent and control the spread of communicable diseases, both among men and animals, we have welded ourselves into one body. No longer are we medical men, or veterinarians, but doctors, dedicated to one purpose — a never ending fight against disease, whether local or foreign in origin, for we are now truly one people and one world. Man's interest in animal diseases cannot be confined to those which are directly transmissible to him, for today's conception of good public health goes far beyond mere freedom from communicable diseases on the part of man. The crying need for meat to feed the world, for milk and other dairy products, makes the medical profession more and more aware of this. The affection of the boy for his dog, the man for his race horse, and the farmer for his herd of cattle is an intangible concept which reaches to the veritable core of our everyday life, for good public health not only embraces freedom from diseases, adequate food and housing — but also happiness brought about through relationship with animals.

Through the application of modern methods of prevention and treatment, such diseases as smallpox, diphtheria, scarlet fever, typhoid, cholera, plague, and yellow fever have virtually been eliminated in many sections of the world. With recently acquired knowledge and the application of measures for the eradication of disease, communicable disease control both in man and animal marches along and shows signs of being maintained at a high level of efficiency. It is of tremendous importance to keep in mind the diseases of animals transmissible to man, human diseases spread by animals or animal products, and the animals which act as passive carriers of disease organisms.

If we had time to trace the progress of veterinary and human medicine, we would see that they have advanced through similar stages, and in various places we would find one helping the other. Development of the science of veterinary medicine had for its original purpose the relief of suffering and the restoration to health of horses, chiefly those used in the armies of that day. However, the science has developed through the years to have as its general objective the relief of suffering and the prevention of disease in all animals, not only those which have great economic value, but also pet animals, which have great sentimental value to man.

Modern veterinary medicine, however, goes far beyond this. In recent years, it has come to be regarded as indispensable to the prevention of infectious diseases in man — an important part of a public health program. Many diseases occurring in man have been found to be natural diseases of lower animals that are transmitted to man through contact, through environment, or through the channels of animal foods.

The world at large is indebted to the veterinary profession for the control of bovine tuberculosis and for enabling the

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Address of welcome by Dr. Wm. F. Lamb at the joint meeting of the Southern Veterinary Medical Association and the Kentucky Veterinary Medical Association in Louisville, Sept. 30 to Oct. 2, 1946. Dr. Lamb is director of communicable disease control, Louisville and Jefferson County Board of Health, and assistant professor of preventive medicine, Louisville School of Medicine.

medical profession to approach the problem of tuberculosis in man more intelligently.

By tuberculin testing and destroying infected cattle, veterinarians have been instrumental in saving dairymen and farmers millions of dollars. This is only part of the story, probably not the most important part. They did their task so well in eliminating bovine tuberculosis and preventing its transmission to man that thousands of human lives have been saved. Medical journals of a few years past are filled with reports of bovine tuberculosis in man contracted through drinking unpasteurized milk from tuberculous cows and of operations performed for the removal of tuberculous glands from the necks of children. Rarely today does the physician, as he makes his rounds through the country, see the agonized expression on the face of the hunchback, or hear the screams of the child suffering from active tuberculous spondylitis or "white swelling" of the knee or hip joint. Unfortunately, physicians cannot boast of similar progress in the control of human tuberculosis. Their problem does not offer so simple a solution. A strict moral code prohibits them from eliminating a human case of active tuberculosis, even though it is hopeless. As a result, tens of thousands of such cases spread the disease to members of their families and their friends who, in turn, become cases of active tuberculosis within a comparatively short time and likewise spread the disease.

Our debt to the veterinarian does not stop with tuberculosis, for we have charted our course to coincide with his in the control of rabies, psittacosis, undulant fever, tularemia, anthrax, typhus, actinomycosis, trichinosis, Rocky Mountain spotted fever, and possibly an unknown number of dermatoses. In each of these cases, it is necessary to know not only the nature of the disease in the animal, but the mode of its transmission from animal to man if progress is to be made in eliminating the disease from man. In this connection, it is particularly noteworthy that a veterinarian was the first to establish the fact that a disease may be transmitted from animal to animal or from animal to man by the bite of an insect. This fact was established before it was discovered that mosquitoes were vectors of malaria, dengue, and yellow fever; that the rat flea was a vector of typhus fever and bubonic plague; and that the bite of a wood tick which had fed on lower animals conveys the rickettsiae of Rocky Mountain spotted fever.

Another definite contribution made by the veterinarian is in the prevention of rabies in the human being. Daily, by observation of animals that have inflicted wounds on human beings, veterinarians are advising physicians when the injured should receive immunization against the disease. Especially valuable is the aid they are furnishing to the commissioner of agriculture, the superintendent of public instruction, and the state commissioner of health. Equally valuable is the aid given representatives of organizations interested in drawing a law, for introduction at the next session of the General Assembly, to insure better control of dogs in Kentucky so that rabies may be reduced. This will be an important economic step, as rabies vaccine for human treatment in Kentucky last year cost the taxpayers $3,550.00 for indigents alone.

Much progress has been made in the elimination of brucellosis from dairy herds with the result that the debilitation and deaths from undulant fever, transmitted largely through milk, have been greatly reduced. It is to be hoped that the day is not far distant when all cows producing milk for human consumption, whether family cows or cows in dairy herds, will be scientifically tested for brucellosis. This is a task for veterinarians, and we must depend on them for the final control of this disease. And too, some means of closer cooperation between the veterinarian and those interested in wild life must be found to prevent tularemia among wild rabbits. Only in this way may we hope for complete elimination of this disease in man.

By the same token, if some efficient, economical, and practical method of extermination of rats could be discovered and generally applied, typhus fever, bubonic plague, and rat bite fever would be reduced to a minimum, while complete elimination of trichinosis in man could be effected by an efficient and practical means of detecting the larvae in the muscles of slaughtered pigs. This, too, is the veterinarian's task.

In recent years, several widespread epizootics of equine encephalomyelitis have occurred in North America. These bear strong resemblances to human poliomyelitis and encephalitis, thus opening a new possibility

for coöperation between veterinarians and physicians.

I might continue along this line, but it is sufficient to say that veterinary medicine has now reached the point where it constitutes an important and indispensable part of medical science in general. The two go hand in hand and have a common objective, namely, the prevention of disease and the amelioration of suffering in all animals, both quadruped and biped.

The veterinarian has secured his place in medicine — in public health — and in each community he serves. New disease prevention and control measures, along with new ideas in animal care, will mean increasing public interest in veterinary medicine. Through coöperative efforts of groups such as this one, health departments, physicians, chemists, and the general public, the work, so ably begun in veterinary medicine, will continue to grow, and public health will continue to thrive through the concerted efforts of your profession.

In the name of the Louisville and Jefferson County Health Department, the Louisville Medical School, and greater Louisville, I bid you welcome.

Army Institute of Pathology Open to Civilian Veterinarians

Written into Army Regulations No. 40-410 (June 7, 1946), titled "Medical Department, Army Institute of Pathology," is a provision that appears to afford considerable technical aid to practicing veterinarians and to institutions engaged in veterinary research.

This regulation, which sets down the organization and functions of the Army Institute of Pathology, provides that instruction will be given by the Institute to "medical, dental, and veterinary officers, and, when facilities are available in connection with instruction to such officers, to such other qualified professional persons who, with the approval of the director, may come to the Institute for study or graduate instruction. The facilities and material of the Army Institute of Pathology may be made available to qualified civilian physicians, dentists, veterinarians, and other scientists for the purpose of pursuing studies in the various fields of pathology."

Prepared by the Veterinary Division, Office of the Surgeon General, Wash., D. C.

The Institute is under the jurisdiction of the Office of The Surgeon General and is directed by a medical corps officer assisted by medical department officers and by military and civilian personnel who form the professional, technical, and clerical staffs. It comprises four departments: Department of Pathology, Army Medical Illustration Service, American Registry of Pathology for the National Research Council, and The Army Medical Museum.

In connection with the administration of the Institute, authorization is made for a scientific advisory board of consultants composed of not over 25 members appointed by The Surgeon General for terms of five years.

The American Registry of Pathology for the National Research Council is composed of subdivisions sponsored and supported by the national medical, dental, and veterinary associations. The regulation provides that the scientific director of the Registry will be appointed by the director of the Army Institute of Pathology on recommendation of the committee on pathology of the National Research Council and with the approval of The Surgeon General.

In addition to the facilities for advanced study and research open to civilian veterinarians, the Army Institute of Pathology, through its Registry of Veterinary Pathology, offers diagnostic service in histopathology to veterinarians. Clinical data on each case, autopsy protocols, and fixed tissues should be sent to the director, Army Institute of Pathology, Washington 25, D. C. A report will be rendered without charge.

Losses in Marketing of Livestock

The 1946 report of the National Live Stock Loss Prevention Board calls renewed attention to the large losses of livestock during the journey from farm to slaughterhouse. The data, based upon records kept by stockyard companies, show that about 50 million pounds of meat was wasted in 1946 because of death on arrival at market, crippling, and bruising—a monetary loss of about $12 million at wholesale prices. Over 100 million additional pounds was condemned on antemortem and postmortem inspection.—*From the 1946 Report, National Live Stock Loss Prevention Board.*

Report on Infectious Equine Encephalomyelitis in the United States in 1946

Abstracted from a report (dated May 27, 1947) by Dr. B. T. Simms, Chief, United States Bureau of Animal Industry

Among 12 consecutive annual records compiled by the U.S.BAI on the incidence of infectious equine encephalomyelitis in the United States, 1946 stands out as the year of lowest incidence, with 2,805 cases reported from 37 states. Average mortality, on the other hand, was higher than in other years. The peak month was September, when nearly one third of all recorded cases occurred. Fewer cases were reported from the South Atlantic and Pacific states than in 1945, but there were more cases in the West North Central states.

The Bureau's virus-serum control division estimates that about 400,000 animals were vaccinated last year (two doses), although less than 93,000 vaccinations were officially recorded. An additional 5,230 horses were vaccinated for the UNRRA, but data are not available on incidence and mortality in this group.

Specimens from 23 equine cases were examined, of which 13 — obtained from Alabama, Florida, Maryland, and Virginia — were positive. Eleven of the 13 yielded virus of the eastern type. Virus was not recovered from the other 2 cases, but histopathologic alterations typical of virus encephalomyelitis were observed. A specimen of brain from a suspected human case of equine encephalomyelitis did not yield virus, yet the pathologic alterations were consistent with those seen in known cases of the eastern type.

(See pages 106 and 107 for fig. 1 and table 1.)

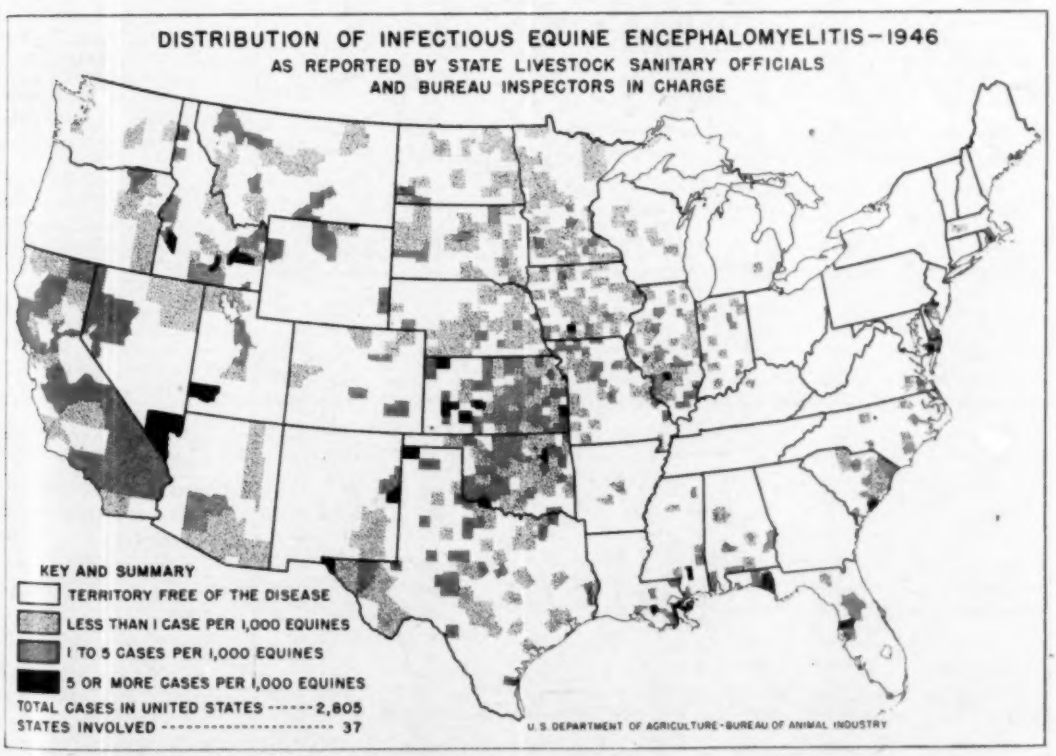
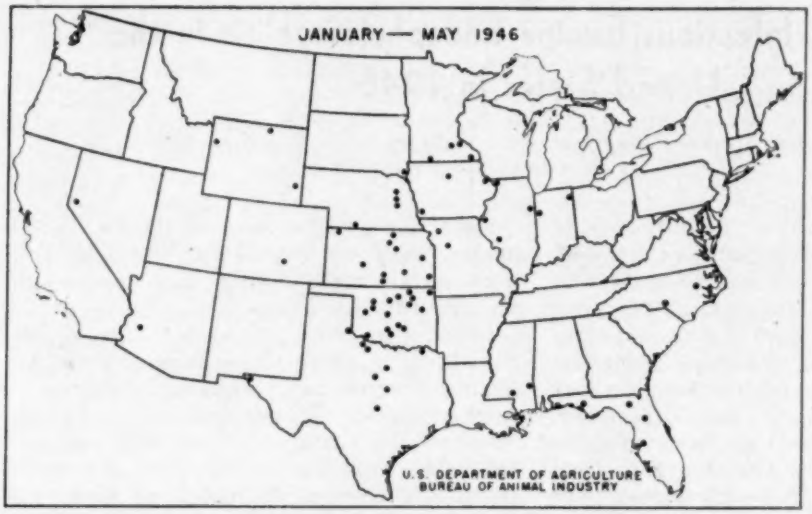
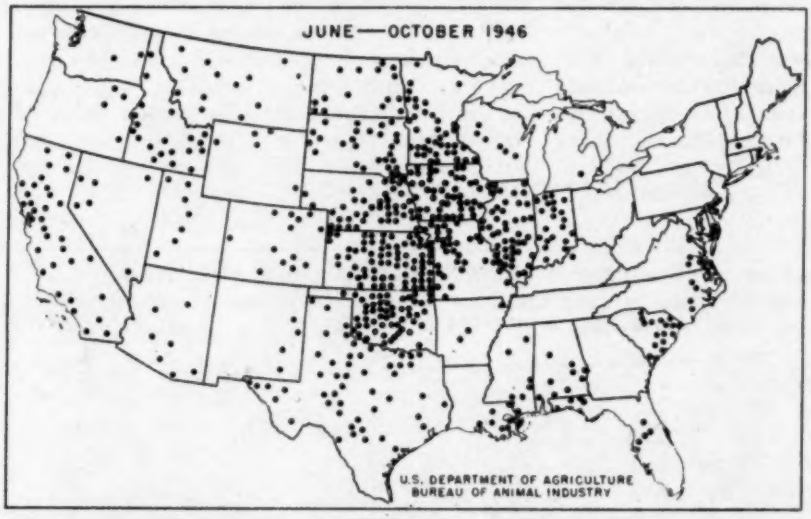


Fig. 2—Distribution and degree of incidence of infectious equine encephalomyelitis, 1946.



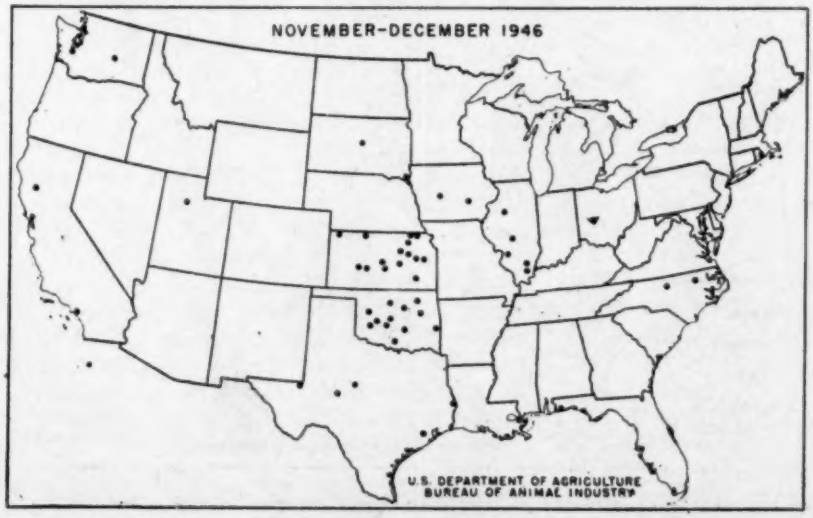
PRE-EPIZOOTIC PERIOD
CASES REPORTED FOR:

JANUARY	9
FEBRUARY	7
MARCH	10
APRIL	62
MAY	68
TOTAL	156



EPIZOOTIC PERIOD
CASES REPORTED FOR:

JUNE	140
JULY	414
AUGUST	685
SEPTEMBER	883
OCTOBER	393
TOTAL	2,515



POST-EPIZOOTIC PERIOD
CASES REPORTED FOR:

NOVEMBER	57
DECEMBER	50
TOTAL	107

Fig. 1—Distribution of reported cases of equine encephalomyelitis according to periods during 1946. Each dot represents a county in which 1 or more cases occurred during the period.

State and division	Horses and mules in affected areas	Animals affected	Cases per 1,000 horses and mules	Total deaths	Deaths per 100 affected animals	Month of report of— First case	Month of report of— Last case
Maine	—	0	—	0	—	—	—
New Hampshire	—	0	—	0	—	—	—
Vermont	—	0	—	0	—	—	—
Massachusetts	3,432	4	1.2	3	75	Sept.	Sept.
Rhode Island	—	0	—	0	—	—	—
Connecticut	—	0	—	0	—	—	—
New England	3,432	4	1.2	3	75	Sept.	Sept.
New York	—	0	—	0	—	—	—
New Jersey	7,229	19	2.6	19	100	August	October
Pennsylvania	—	0	—	0	—	—	—
Middle Atlantic	7,229	19	2.6	19	100	August	October
Ohio	—	0	—	0	—	—	—
Indiana	44,067	28	0.1	19	68	Jan.	Sept.
Illinois	219,865	150	0.7	38	25	Jan.	Dec.
Michigan	3,490	1	0.3	0	0	July	July
Wisconsin	43,220	10	0.2	1	10	June	Sept.
East North Central	310,642	189	0.6	58	31	Jan.	Dec.
Minnesota	276,495	113	0.4	37	33	May	October
Iowa	291,970	178	0.6	45	25	April	Nov.
Missouri	229,119	174	0.8	41	24	April	October
North Dakota	80,478	24	0.3	8	23	June	October
South Dakota	130,093	65	0.5	15	23	May	Nov.
Nebraska	233,269	81	0.3	25	31	April	Sept.
Kansas	313,363	421	1.3	108	26	April	Dec.
West North Central	1,554,787	1,056	0.7	279	26	April	Dec.
Delaware	6,829	15	2.2	12	80	July	October
Maryland	8,035	17	2.1	17	100	July	August
Virginia	11,711	10	0.9	10	100	July	October
West Virginia	—	0	—	0	—	—	—
North Carolina	35,327	30	0.8	14	47	Jan.	Dec.
South Carolina	65,503	78	1.2	66	85	May	October
Georgia	—	0	—	0	—	—	—
Florida	14,891	70	4.7	68	97	March	Sept.
South Atlantic	142,296	220	1.5	187	85	March	Dec.
Kentucky	6,208	1	0.2	1	100	July	July
Tennessee	—	0	—	0	—	—	—
Alabama	40,785	62	1.5	53	86	June	Sept.
Mississippi	25,393	21	0.1	0	0	Feb.	Sept.
East South Central	72,386	84	1.1	54	64	June	Sept.
Arkansas	8,253	3	0.4	2	67	August	October
Louisiana	19,876	59	3.0	59	100	July	August
Oklahoma	300,646	355	1.2	79	22	Jan.	Dec.
Texas	216,504	137	0.6	42	31	April	Nov.
West South Central	545,279	554	1.0	182	33	April	Dec.
Montana	58,526	56	1.0	18	32	July	Sept.
Idaho	89,362	187	2.1	39	21	July	October
Wyoming	20,313	33	1.6	7	21	May	Sept.
Colorado	67,247	57	0.8	19	33	April	October
New Mexico	11,430	13	1.1	2	15	July	October
Arizona	44,392	26	0.6	9	35	April	Sept.
Utah	29,895	39	1.3	23	59	June	Nov.
Nevada	25,248	32	1.3	9	28	May	Dec.
Mountain	346,413	443	1.3	126	28	April	Dec.
Washington	10,751	8	0.7	1	13	August	Dec.
Oregon	26,671	90	3.4	0	—	Sept.	Sept.
California	117,435	138	1.2	48	35	June	Nov.
Pacific	154,857	236	1.5	49	21	June	Dec.
Total or Average	3,137,321	2,805	0.9	957	34	Jan.	Dec.

TABLE I—Infectious Equine Encephalomyelitis. Summary of Reports on Incidence and Mortality by States, 1946

Historical Sketches and Memoirs

IV. Organized Veterinary Medicine

(Continued)

L. A. MERILLAT

Chicago, Illinois

4.

Science of Organization

The "science of organization," which is Strangeway's definition of anatomy, fits into this theme like a block of mosaic because when taking organized veterinary medicine apart to see what makes it tick, one must go into its embryology as well as the dimensions and relations of its components. The histology is largely skipped for fear of telling tales that ought to be forgotten and, Dear Subscriber, *do* remember that these are the writer's personal views founded on personal memory. Whence came the AVMA, the state associations, and the regional (local) groups now flourishing in every nook for the first time since Robert Jennings of New Jersey and Isaiah Michener of Pennsylvania, two self-trained veterinary surgeons, started the American Veterinary Association at Philadelphia in 1854? Books — schools — journals — societies, the sequence of veterinary development in the rest of the world, doesn't apply so well to the United States because here we founded an association ahead of a viable veterinary college. If lame, hesitant, and wobbly along the way, it nevertheless has lived to boast of bigness and strength, and to finally mother the state organization as the founders anticipated. Even as of 1947, Anatomist Foust exclaimed (shall I say with sarcasm?), "So You Are a Member of the AVMA!" (*J.A.V.M.A.*, May, 1947: 293.) That tells much for one headline. One traveling about the country in 1900 would have found few full-fledged members of a veterinary association, and a spontaneous desire to join one was practically nil.

Passing up the farther-away nineteenth century as all but a total failure in the numerical sense, it took more than thirty years of this century to inject health and vigor into the associations. In 1929 (*J.A.V.M.A.*, *75*, Sept., 1929: 267), the proposal of the short-lived National Veterinary Medical Association of the early 1880's to organize and federate state associations was brought up by President T. E. Munce, whereupon the JOURNAL thought, editorially, that it would be a good idea *(sic)*. I wonder if my readers in 1947 can imagine the reaction of the old timers who had struggled without let-up for fifty years for that very thing. What I am trying to say is that organized veterinary medicine was so badly *unorganized* right up to 1929 that one administration didn't seem to have the faintest idea of what preceding administrations had been "cooking up." I cite this particular incident to prove that officials who took command year after year were not even aware that consolidating the state associations under the wing of the national had been a major project, continuously debated, before the executive branch and business sessions of the AVMA since 1880. That, sir, is the cost of flouting history and holding office without trying to learn "what it's all about."

5.

Make-believe Organization

To understand organized veterinary medicine in the United States and Canada as it now stands, one must first agree that, in the true sense of the term, there was no organization until the House of Representatives took hold at the New York meeting in 1934. In other words, from 1854 to 1934, a span of eighty years, our AVMA was loose, unmanaged, incompetent, and make-believe in character. Note that these strong adjectives do not insinuate that nothing was achieved. The marvel is that so much was achieved. The question is what might have been achieved had the AVMA got behind the founding and building up of state associations, binding them into a central one as was proposed in 1884.

A true democracy was established in the medical profession in 1901; in ours, thirty-three years later. The issue, in both, was constantly debated and ardently worked for almost from the very beginning of the AMA and AVMA, in the middle of the nineteenth century. The British Medical Association was held out as an example of

consolidating local societies (*Brit. Med. J.*, June, 1947: 4509). Among the advocates of united local societies were Oliver Wendell Holmes, Nathan S. Davis, founder of the AMA, and George H. Simmons, long-time editor of the *Journal of the American Medical Association*, who is credited with having effected that long sought reform which made organized medicine what it is today in the United States.

Likewise, in the veterinary profession there were strong workers for consolidating, but its advocates always found it hard to bring the issue to a head in open meeting. It was the most pigeon-holed reform ever brought before the veterinarian in this country—in fact, few of the rank and file ever knew that such a plan actually existed. The issue lay in pigeon holes for more than twenty-five years, to be brought out only during the teen decade under the leadership of C. A. Cary, D. M. Campbell, C. E. Cotton, *et al.* The opposition to forming a solid, workable, nation-wide society of veterinarians was strong and continuous—hard to break through because of the fear of centralized direction and control. The AVMA had power only because it had no opposition—no enemy outside of its own ranks—and had the total livestock resources of a great country to exploit. It had big problems on its hands and rejected the means needed to solve them. There has been no doubt in my mind at any time since the 1880's that if strong state associations had been founded and tied to a national society in the nineteenth century, America would have had the type of veterinary service we are now striving so hard to develop against powerful agencies, not then existent—agencies which ought to be negotiated to the people's advantage.

The shortage of college-trained veterinarians, and the training of all kinds of noncollege technicians to fill the gaps, is *the price the profession of 1947 is paying for eighty years of loose organization.*

6.

Committees on Education and Others

We are still prone to over-rate the rôle played by the AVMA in the field of education. Its committees on education, under various names, have rendered yeoman service in correcting faults, but their work, until recently, has been confined to keeping college curriculums within the narrow bournes of current respectability. Marshalling professional opinion in favor of formal veterinary education *under public support*, and proposing the strengthening of the organization necessary to accomplish that purpose, were never on its agenda. These committees appeared to believe that acting as policemen of the private schools was their sole reason for existence. At every point between the Civil War and World War I, some effort might have been made to set veterinary colleges securely in the system of public education.

In retrospect, I regard the failure to establish a thorough-going public veterinary education, such as Law, Detmers, Stalker, Huidekoper, and McKillip conceived, in the 1870's and 1880's, as the most reprehensible fault of organized veterinary medicine in America. That is to say, private veterinary colleges should never have been allowed to become the national necessity they were. There was but to come to the aid of Osgood and Lyman at Harvard, MacEachran at Montreal, Huidekoper at Philadelphia, Law at Cornell, and Stalker at Ames, to build up a higher standard of veterinary service for the American people through formal education. Support of public education ought to have been the main, not the ignored, function of organized veterinary medicine right from the start. It's the main function now, and yet one seldom hears of committees of associations marching off to state legislatures to help the dean to get money for a new building or for better pay for his faculty. Generally, the dean has to paddle his own canoe in shallow waters. This is not growling over spilt milk. It's just a hunch that veterinarians, whatever the rank or phalanx, ought to do more toward material support of their alma maters. All affluence stems from there.

(*To be continued*)

Addendum.—Dr. Leon Z. Saunders, Iowa State College, writes: "I have just finished reading 'Historical Sketches and Memoirs' in the July, 1947, JOURNAL, and I thought it should be pointed out that the first veterinary journal to be published in Canada was the *Canadian Veterinary Record*, published from 1920 to 1923, at which time it apparently died from lack of support."

SURGERY & OBSTETRICS

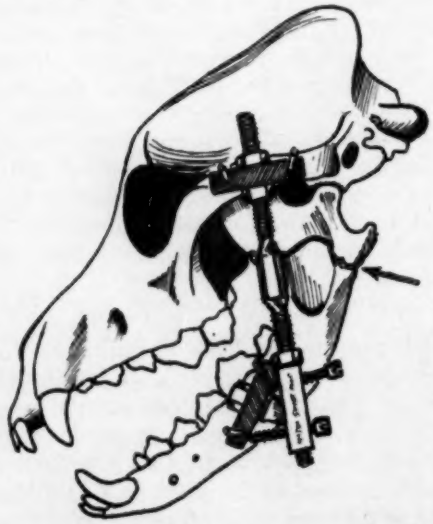
AND PROBLEMS OF BREEDING

Unusual Management of Mandibular Fracture in a Dog

W. W. ARMISTEAD, D.V.M.
College Station, Texas

ON MARCH 25, 1946, there was presented to the clinic for treatment a 6-month-old, black, crossbred dog with a simple fracture of the left ramus of the mandible and a compound, comminuted fracture of the right ramus. The simple fracture was just below the articulation, across the masseteric fossa. The compound, comminuted fracture, located in the vicinity of the mental foramen, had resulted in the loss of the second and third right molars. Movement of the jaw was so painful that the animal refused to eat or drink.

An attempt was made first to immobilize the jaw in a partly opened position with the size 0 Stader splint bridging the simple fracture. One pin bar was placed below the simple fracture and roughly parallel to the long axis of the ramus. Since the upper fragment was very short and almost inaccessible, the other pin bar was placed at a right angle to the first with the pins in the zygomatic arch. The compound fracture was immobilized by wiring a tongue depressor, padded with a piece of heavy synthetic rubber sheeting, alongside the right ramus.



—*Armistead*

Fig. 1—Drawing showing use of the Stader splint in the simple fracture.

For several days this arrangement appeared to be satisfactory. However, soon the leverage brought to bear by movements of the jaw loosened the pins in the zygomatic arch, indicating that it was too weak to carry one end of a Stader splint. It was necessary to remove the pins. Since, by this time, a part of the lip had necrosed from pressure, the tongue depressor contrivance was removed also.

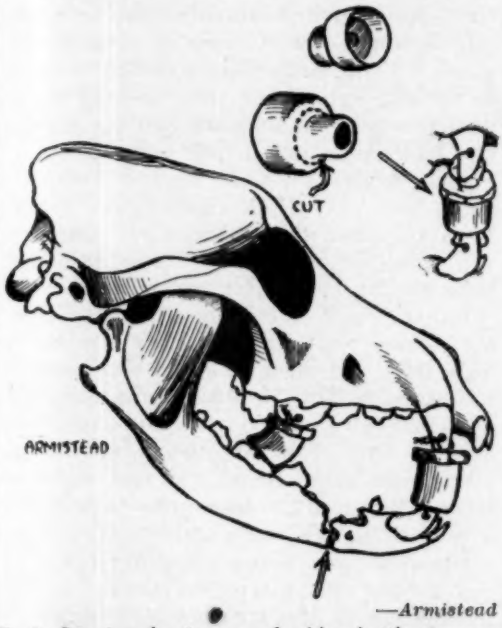
With a bone drill, a hole was drilled transversely through the crowns of each canine tooth, each superior fourth molar, and each inferior fifth molar. Silver wire was passed through these holes and the jaw was wired shut against four rubber hypodermic bottle stoppers. Stoppers from 500-cc. bottles were used between the molars. Stoppers from 60-cc. bottles were used between the canine teeth. In each case, the wire was passed through the stopper to hold it firmly in place.

With this arrangement, the incisor teeth were parted sufficiently to permit feeding through a stomach tube and the compound fracture wound was accessible for local treatment. After about ten days, the animal was fed by passing small cubes of cooked or raw meat between his incisors, and he learned to drink water and milk unassisted from a deep bowl.

During the early part of his hospitalization, this dog was given dextrose and physiologic saline solution daily and was dosed heavily with penicillin. On two oc-

casions, small sequestrums were extracted from the compound fracture wound.

By May 20, 1946, the fractures had healed and the wires and stoppers were removed. Although movement of the jaw



—*Armistead*

Fig. 2—Drawing showing use of rubber bottle stoppers between the teeth and the transverse drills through the crowns of the teeth in the compound fracture.

was limited, the animal was able to eat and drink and was in good general health, so he was released from the hospital. We had intended to fill the holes in his teeth with dental amalgam but were advised against this by two practising dentists.

On Oct. 13, 1946, we received a letter from the owner saying that the animal was in excellent health, had regained almost normal use of his jaw, and had had no apparent trouble from the handmade cavities in his teeth.

Curare as an Adjunct to Anesthesia

Curare in the form of tubocurarine which is being used increasingly as a relaxing adjunct to anesthesia in human surgery will come to the veterinary clinic with critical information acquired by the experiences of expert human anesthetists. A drug that will quickly bring about profound relaxation of both voluntary and involuntary muscular systems, independent of the action of the anesthetic itself and that blends harmoniously into the physiology of a surgical job, is an adjunct in need. Whether tubocurarine should be given before, during, or after the procedure is the debatable subject, because the increase of CO_2 tension and decrease of O_2 tension associated with respiratory depression of any surgical anesthesia must be carefully watched when the action of tubocurarine is added. The danger is greatest when the relaxant is given before or early in the course of the operation. Therefore the drug is safest in the closing stage of the operation.

Blood Transfusion

On the chronological schedule of outstanding medical discoveries, blood transfusion is new. It dates back only to World War I. Before that historic event, hematologists had not thought of blood cell variations in terms of disease of the mechanism producing them. Erythroleucemic myelosis, as a disease entity, was first mentioned during the postwar period (1917-1920). By 1926, the literature was mentioning acute erythremic myelosis and acute leucemic myelosis and, by 1939, these and the chronic myeloses were held responsible for the variations of the blood picture. Clinical, histopathologic, and anatomic observations contributed to the present knowledge of blood. Erythremic (myeloid) diseases *per se* were first mentioned in 1941 by the Italian Hematological Society. Much was learned through the custom among European veterinary clinical pathologists of using the long bones as specimens for bacteriologic investigations [compared with the conventional pots of organic specimens] in the study of diseases of chickens and other animals. These led to the transmission of spontaneous myeloid disease to experimental animals and to its scientific treatment.—*From Revue d'Hématologie, 1, (1946): 355-398.*

Pentothal-curare anesthesia gives agreeable induction, complete relaxation, a quiet surgical field, and rapid recovery from the anesthetic state. — *From British Medical Journal.*

Quantitative correction of blood-volume deficits by whole blood transfusion increases the tolerance of "poor risk" patients for major surgery.—*Ann. Surg., May, 1947.*

Treatment of Multiple Round-Cell Sarcomas of the Skin in Dogs

Numerous skin tumors of dogs are classified as round-cell sarcomas because of their clinical similarity: They are intracutaneous. When first noticed, they are usually 1 to 3 cm. in diameter, and 0.5 cm. in depth. The surface is raised, hairless, red, and exudes serum. Growth is rapid. They usually occur singly, though Khuen[4] and McClelland[5] each reported a multiple case in 1940.

Histologic diagnosis reveals various types of neoplasms included in the group. Thibideau and Burck[1] prefer to call them all round-cell sarcomas. Elton[2] agrees with Olafson[3] that many of the tumors resemble myelomas. Stewart[7] examined two of the group which occurred on the lips and wrote, "don't know, possibly infectious lymphosarcoma." Geschickter[6] examined several sections and believed them to be malignant, either lymphoblastomas or reticulum-cell sarcomas. Schlotthauer, who examined Khuen's case, diagnosed the condition as "a very active mycosis fungoides type of tumor tending to lymphosarcoma."

Bloom[8] examined a few sections from our series and found a reticulum cell sarcoma, a large round-cell sarcoma, and two, small, round-cell sarcomas. He examined a section of Khuen's case and believed it to be a histiocytoma. He classified our multiple case as malignant lymphoma.

During the past seven years we have seen 3 additional cases of multiple round-cell sarcomas of the skin. The first was a 2-year-old, male Springer Spaniel. The animal had about 20, firm, button-shaped nodules in the skin of the shoulder and back. The lesions were 0.5 to 3 cm. in diameter, surfaces raw and exuding bloody serum. The cross section was firm, white, and glistening. A biopsy specimen was diagnosed as round-cell sarcoma, confirmed by Thibideau, Burck, and Elton. Nine-tenths Gm. of neoarsphenamine, dissolved in distilled water, was injected intravenously on the first, fourth, seventh, and fourteenth day. Following the third injection the surfaces of the lesions ceased to exude. Several had atrophied completely, leaving a circumscribed, dry, hairless area. A partly atrophied lesion was excised on the fifteenth day. The section showed degenerative changes of the tumor cells, deposits of nuclear débris, and infiltration of leucocytes.

The second case was a Doberman Pinscher, 1-year-old, female, with multiple tumors of the skin of the abdomen. A biopsy was sectioned and diagnosed as a round-cell sarcoma. Four doses of neoarsphenamine, 0.5 Gm. each, were injected at seven- to ten-day intervals. One week after the final treatment the lesions had disappeared and had not recurred four years later.

Case 3 was a female Boston Terrier, 3 years old. A single lesion was excised from the skin of the chest and diagnosed as round-cell sarcoma. Forty-three days later the animal was returned to us: The original tumor had recurred and ten similar lesions were noted in the skin of the legs, face, and chest. A lesion was removed, examined by Dr. Thibideau, and diagnosed as round-cell sarcoma. Twenty-seven hundredths Gm. of neoarsphenamine was administered, followed by 0.35 Gm. one week later. Seven days later the tumors had atrophied to the point where only circumscribed hairless areas were present.

We have not attempted to use neoarsphenamine in the treatment of single tumors in this group. They usually respond favorably to excision, freezing with ethyl chloride, or x-ray therapy—*Robert B. McClelland, D.V.M., Buffalo, N. Y.*

References

[1]Thibideau, A. A., and Burck, E. M., pathologists, Roswell Park Memorial Institute, Buffalo, N. Y.: Personal communication. 1938-1946.
[2]Elton, Norman, formerly pathologist, Millard Fillmore Hospital, Buffalo, N. Y.; Personal communication. 1939-1940.
[3]Olafson, Peter, pathologist, New York State Veterinary College, Ithaca, N. Y. Oct. 18, 1939.
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[5]McClelland, R. B.: Neoplasms in Dogs. Cornell Vet., *30*, (1940): 161-166.
[6]Geschickter, C. F., pathologist, Johns Hopkins Medical School, Baltimore, Md.: Personal communication through Elton, 1940.
[7]Stewart, Fred, pathologist, Memorial Hospital, New York, N. Y.: Personal communication through Elton, 1940.
[8]Bloom, Frank, D.V.M., Flushing, Long Island, N. Y.: Personal communication, Nov. 28, 1945.

"How much water should the postoperative patient be allowed?" is a question that must be answered correctly. The wrong answer may account for death.

Prothrombin is formed in the liver.

Histamine Therapy in Small Animal Surgery

Inasmuch as histaminotherapy is the order of the day, it merits experimental study in veterinary medicine to confirm former reports of the clinic and research spheres. M. Radeau (*Thesis*, Paris, 1946) studied the chemical and physiologic phases of the subject in their application to clinical work, from the discovery of histamine in ergot of rye in 1903, down to the recent methods of preparation, identification, and quantitative determinations in the living body. Physiologically, histamine is the degradation product of the *alpha* amino acid histidine formed in the course of protein fragmentation (in digestion, muscular effort, cutaneous reactions, *et al.*) to harmful ends: pounding heart, sweating, hypotension, hyperglycemia, peripheral congestion, miosis, salivation, hyperperistalsis, all of which were not only produced experimentally in dogs but put to use, therapeutically.

The therapeutic dose was established at 0.5, 0.75, and 1.0 cc. of a 0.05 per cent solution, hypodermically. The indications in which there were important responses were arthrites, luxations, neuralgias, and ulcers. An interesting result was the prompt amelioration of the rebellious ulcers of the tails of dogs.

The First Molar

When the health column of a leading newspaper was headed "First Permanent Molar Held Most Important," veterinarians of the horse and buggy period must have vividly recalled the recalcitrant fourth grinder (first by right) of the soliped. The columnist might have explained in greater detail that the first, or six-year, molars of children are the nonreplaceable keystones of the four dental arches, the crushers, the hubs of the millstones, and the sites of many a toothache that are too often extracted, thoughtlessly, regardless of the stellar rôle they have to play athwart the years to come. What an analogy of the old veterinary clinic where this anatomic unit was found to have been really persecuted by nature and art.

Laboriously breaking through behind the unfinished arcade, in horses, at the age of 10 months, this tooth is pretty much "on its own" for the next two or more years. Its neighbor behind is slow in arriving and the "baby tooth" forward is pretty busy getting out of the way of the new one crowding underneath, all to the bad so far as grinding, not soft boiled eggs and milk toast, but hay and oats and ear corn. That the first (fourth) molar of the horse stands up at all is the marvel of equine physiology. Often it doesn't. It cracks up from malnutrition of the stalk-field variety, unbalanced rations, fluorosis, disturbing diseases of youth and adolescence, precocious training, neglected dental attention, or perhaps in the other extreme, forced feeding to step up growth and gains. The rest is paradental pathology of the jaws, the facial sinuses, and the system; repercussions of imperfect mastication. The first permanent molar *is* an important organ, indeed. And, the same thesis doesn't stop with horses and mules.

Breeding Problems and the Dairyman

"Correcting breeding troubles in the herd is often a complex and difficult problem. When considering the recommendations contained in this article, remember that a competent, experienced veterinarian should be the farmer's best friend. Consult him when questions of diagnosis and treatment arise in your herd." This is the editorial introduction to an article on breeding troubles published in *Hoard's Dairyman* (Apr. 10, 1947). When the readers of this magazine come to consult you, will you prove competent and experienced?

Wound Chemotherapy—Sulfamylon

As a subcutaneous antiseptic, a mixture of sulfamylon (5%) and streptomycin is nontoxic, relatively stable, and possesses an almost complete range against bacterial activity, including the anaërobes of gas gangrene. Soft, white healing is reported by E. L. Howes (*Surg., Gyn.,* and *Obst.*, July, 1946) after successfully suturing 30 contaminated wounds. The treatment was ineffective in open wounds containing necrotic or sequestered tissue, and it also failed to prevent the growth of *Bacillus pyocyaneus* over the surface of wounds and burns.

Granulating wounds may be topically treated with tyrothricin, parachlorophenol, or zephiran, but these substances are too toxic to be used within the tissues.

Artificial Insemination as a Means of Transmission of Bovine Venereal Trichomoniasis

DAVID E. BARTLETT, D.V.M., KEITH G. TEETER, B.A., and PAUL C. UNDERWOOD, D.V.M.

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CONTROL of venereal disease is one of the advantages frequently claimed for the practice of artificial insemination of cattle. This claim is valid in the case of bovine venereal trichomoniasis, provided bulls used as sources of semen are free from *Trichomonas foetus* infection. In fact, a hygienic breeding program in which artificial insemination is a valuable adjuvant procedure, if properly carried out, is of value in freeing herds of trichomoniasis.[1] Experimental studies, however, indicate that when bulls harboring *T. foetus* are used as sources of semen, artificial insemination instead of being an aid in controlling trichomoniasis can become a dangerous practice, capable of transmitting bovine venereal trichomoniasis to innumerable breeding females, and thereby introducing this disease into many herds.

This paper (1) reports several instances of transmission of *T. foetus* infection through artificial insemination with semen collected from an infected bull and (2) points out the potential dangers of bovine venereal trichomoniasis in artificial insemination programs if bulls used as sources of semen are infected with *T. foetus*.

EXPERIMENTAL PROCEDURES

For the purpose of another experiment in a herd under the supervision of one of the writers (Underwood), it was necessary to breed 9 previously uninfected dairy heifers and cows to a bull known to be infected with *T. foetus*. Being cognizant of the probable incidence of transmission that might be expected if coitus were permitted,[2] it was decided to accomplish these matings by means of artificial insemination. It was hoped, optimistically, that by this procedure the actual incidence of transmission to these females might be somewhat reduced. In carrying out these inseminations, the usual technique, artificial vagina, and other equipment were employed. Semen was ejected into the external cervical os, undiluted and uncooled, shortly after collection.

Subsequent to the initial insemination, vaginal samples were collected weekly from each female and examined microscopically for the presence of *T. foetus*, in accordance with the previously described procedures.[3] Inseminations made subsequent to the initiation and recognition of trichomoniasis in those females that became infected are not considered in these data.

RESULTS

Infections resulting from a total of 13 inseminations of 9 previously uninfected breeding females with semen collected from a trichomonad-infected bull by means of the artificial vagina technique are as follows: Six females developed trichomoniasis as a result of a total of seven inseminations—5 as result of initial insemination, and 1 as result of second insemination. Three females did not become infected despite a total of six inseminations—1 was inseminated one time, 1 two times, and 1 three times.

DISCUSSIONS AND CONCLUSIONS

Specific instances of transmission of trichomoniasis from infected bulls to females, albeit generally accepted as having occurred, have not often been recorded in veterinary literature. No reference indicative of the relative frequency of transmission by artificial insemination compared with coitus is available.

Garlick[4] reported infections in 2 cows resulting from insemination with semen collected from an infected bull by means of the Miller and Evans massage technique.[5] Bartlett and Hammond (files of the Zoölogical Division) in 1941 observed an instance where an infected bull accidentally accomplished coitus with a

This work was carried out at the United States Department of Agriculture, Agricultural Research Center, Beltsville, Md.

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"teaser" heifer immediately prior to serving an artificial vagina. The "teaser" heifer became infected; another heifer inseminated with the artifically collected semen did not become infected. A third heifer became infected subsequent to insemination with semen collected by artificial vagina from the same infected bull six weeks later.

Comparison of the results reported herein (in which a total of 13 artificial inseminations of 9 previously uninfected females resulted in infection of 6 of the females by a total of seven inseminations and no infections in 3 of the females despite six inseminations) with the results reported by Bartlett[2] (in which 24 previously uninfected females were permitted coitus with infected bulls a total of 28 times resulting in infection of all 24) indicates that the probable incidence of transmission from an infected bull to females, under the conditions of these experiments, may have been somewhat reduced.

It is true that the semen used in the present series was not subjected to certain of the conditions to which semen used by large-scale, artificial insemination units is customarily subjected. However, these additional procedures, even though they might further lower the incidence of transmission somewhat, logically would not be expected to prevent transfer of *T. foetus*. The phosphate or citrate egg yolk diluents are innocuous, although, the dilution *per se* might effect some reduction in transmissions. Refrigeration might also cause some reduction as low temperatures do materially reduce the number of *T. foetus* in cultures and in preputial samples. However, *T. foetus* was found in cultures after eleven days of refrigeration when these cultures were warmed to room temperature daily to permit a microscopic search for motile organisms. Also, *T. foetus* was found in preputial samples after seventy-two hours of refrigeration. Further investigation may permit precise evaluation of these factors.

The specific demonstration that indirect transmission of trichomoniasis by artificial insemination occurred readily and regularly, without sexual contact, was the significant point in these observations. The apparent decrease in incidence of transmission, compared with coitus, was of incidental interest and of experimental importance only.

The implications of these findings are obvious—rapid, widespread dissemination of trichomoniasis is probable should infected bulls be used, unwittingly, as sources of semen. The danger of unintentionally contributing to the spread of bovine venereal trichomoniasis merits constant serious consideration by responsible artificial insemination organizations. It is of extreme importance that the status of all bulls[6] serving in such units be carefully determined by a competent diagnostician.

SUMMARY

1) Nine previously uninfected females were inseminated with undiluted semen, immediately after collection by means of an artificial vagina, from a bull infected with *Trichomonas foetus* with results as follows: 6 became infected as a result of seven inseminations; 3 did not become infected despite six inseminations.

2) The possibilities of artificial insemination furthering dissemination of bovine venereal trichomoniasis is discussed, and the importance of regularly ascertaining the status of all bulls intended to be used for sources of semen is emphasized.

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American livestock growers will have to learn how to live with foot-and-mouth disease unless the outbreak in Mexico is stamped out promptly, in the opinion of the USDA veterinarians.—*American Hereford Journal, February, 1947.*

CLINICAL DATA

The Use of Propylene Glycol as an Incubator Fumigant

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THERE HAS been an increasing demand by the hatchery industry for an incubator fumigant which can be used safely, effectively, and without the objectionable features of formalin. Although formalin is a powerful disinfectant, it has several undesirable qualities such as volatility, obnoxious, penetrating odor, and caustic action. If not used precisely according to instructions, it may be toxic to embryos and chicks.

FORMALIN

Search for other chemicals which might prove as efficient as formalin in the control of disease transmission in incubators has failed. The purpose of this preliminary report is to examine the efficacy of propylene glycol as an incubator fumigant.

Review of the Literature.—Before discussing propylene, it seems advisable to review the recent research work on formalin which has brought controversies concerning the optimum amount of formalin and the duration of exposure that is lethal to the avian pathogens present in incubators.

The development of large incubators of the forced-draft type created a demand for better hatchery sanitation to aid in controlling pullorum disease. Dakan and Speer[1] and Bushnell, Payne, and Coon[2] found 35 cc. of formalin and 17.5 Gm. of potassium permanganate per 100 cu. ft. of incubator capacity to be a minimum lethal dosage for the control of *Salmonella pullorum*. The majority of past recommendations are based upon their findings.

Graham and Michael[3] demonstrated that formalin fumigation by the use of the cheesecloth method is more efficient and less expensive than the liberation of formalin by the potassium permanganate method. Less than one-half the quantity of formalin, in two applications, by the cheesecloth method gives the same results as three applications by the potassium permanganate method.

According to Bittenbender,[4] the ventilators of the incubator may remain unchanged during formaldehyde fumigation for seven minutes. If desired, the gas may then be neutralized by introducing half as much ammonium hydroxide into the machines as the amount of formalin used.

Godfrey, Buss, and Winters[5] studied the effectiveness of the cheesecloth method in the newer models of incubator hatchers and in separate hatchers. They report that the number of bacteria per cubic foot of air, during the hatch, was greater in separate hatchers than in incubator hatchers. This was attributed to the greater number of hatching eggs per cubic foot of air space in the separate hatchers.

TABLE 1 — Effect of Glycol Vapors on Chicks in Incubators

Eggs set	Chicks exposed	Time exposed	Method of exposure	Effect on chicks	Mortality
150	89	48 hr. continuous	Propylene glycol—100W	None at end of 3 wk.	1†
175	80	24 hr. continuous	Triethylene glycol—200W	None at end of 3 wk.	0
...	100	10 min. 1 application in incubator	Propylene glycol* Potassium permanganate	None at end of 10 da.	0

*Potassium permanganate caused a violent oxidation reaction in the presence of propylene glycol.
†Cause unknown.

Their technique consisted of placing a loopful of *S. pullorum* on a small piece of absorbent cotton. The cotton was held in place by wire gauze in a Petri dish, which allowed the air to circulate around the cotton. After fumigation, the cotton was cultured to determine the effects of the formalin. They found that 15 cc. of formalin per 100 cu. ft. of space was sufficient for the destruction of *S. pullorum*, when using the cheesecloth method in four out of five separate hatchers.

Research work conducted by Gwatkin[6] and, more recently, by Wright, Garrard, Marcellus, and Burton,[7] indicates that the dosage of formalin commonly used by hatcherymen in

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The Dow Chemical Company, Midland, Mich., and M. F. Robertson Sons Company of Danby, Pa., supplied the propylene glycol used in this experiment. The vaporizer was furnished by F. N. P. Supplee of Philadelphia.

TABLE 2—Effectiveness of Propylene Glycol against Salmonella Gallinarum Organisms

Incu.*	Incu. capac.	Material exposed	Length of exposure	Vapor. capac.†	No. trials	Results‡
D	1,720	Culture dried on glass plates	2-4½ hr.	100-w.	6	4 not k. 2 k.
D	1,720	Moist cotton plug	½-5 hr.	100-w.	6	6 not k.
D	1,720	Moist cotton plug	15-19 hr.	100-w.	3	3 k.
D	1,720	Moist cotton thin pad	½-19 hr.	100-w.	17	17 k.
D	1,720	Sprayed chick	16 hr.	200-w.	8	Not k.
D	1,720	Sprayed chick	Control	no fumigant	4	Not k.
D	1,720	Unexposed	Control		6	Heavy growth.
S	28,000	Dry cotton plug	3 hr.	200-w.	6	6 k.
S	28,000	Dry cotton plug	15 hr.	200-w.	5	5 k.
S	28,000	Dry cotton plug	18 hr.	200-w.[1]	4	3 k. 1 not k.
S	28,000	Tryptose agar plates	12 min.	No fumigant	2	Plate 1 (10 col.), plate 2 (50 col.) not hatching.
S	28,000	Unexposed	Control	No fumigant	2	Heavy growth.
F	30,000	Moist cotton	2½ hr.	1-100-w.	2	K.
F	30,000	1 cc. broth	9½ hr.	1-100-w.	2	Not k.
F	30,000	Dry cotton plug	9½ hr.	1-100-w.	2	Not k.
F	30,000	Dry cotton plug	2 hr.	1-150-w.	2	K.
F	30,000	Dry cotton plug	9½ hr.	1-150-w.	3	K.
F	30,000	Tryptose agar plates	15 hr.	No fumigant	2	Light growth Staph. and spreaders.
F	30,000	Tryptose agar plates	2 hr.	400-w.[2]	2	Light growth Staph. and spreaders.
F	30,000	Dry cotton plugs	2 hr.	400-w.	2	K.
F	30,000	Dry cotton plugs	6 hr.	400-w.	6	5 k. 1 not k.
F	30,000	Dry cotton plugs	9 hr.	400-w.	3	k.
F	30,000	Tryptose agar plates	9 hr.	400-w.	3	Dehydrated no growth.
L1	30,000	Moist cotton plug	1 hr.	1-100-w.	1	Not k.
L1	30,000	Moist cotton plug	1 hr.	1-100-w.	1	Not k.
L2	60,000	Moist cotton plug	1 hr.	1-100-w.	1	Not k.
L2	60,000	2 moist cotton plugs	1 hr.	2-200-w.	2	Not k.
L2	60,000	1 dry cotton plug	1 hr.	2-200-w.	1	Not k.
L2	60,000	Dry cotton plug	16 hr.	2-200-w.	1	K.

*Incu.=Incubator. †Vapor.=Vaporizer. W=Watt. ‡K.=Killed.
[1]200-w. used plus an improvised vaporizer that vaporized 3 oz. in eighteen hours.
[2]Three vaporizers used. One 100-w. infrared bulb and two 150-w. incandescent bulbs.

this country is not adequate to kill all *S. pullorum* in incubators. Because of the wide variation in the recommendations of American and Canadian workers, an attempt was made to arrive at a standard method of fumigation. Wright *et al.*[7] found that 150 cc. of formalin and 100 Gm. of potassium permanganate to each 100 cu. ft. of incubator space, when left for twenty minutes, would kill *S. pullorum* in any part of the incubator in most cases. This is 4.3 times the quantity of formalin commonly recommended in this country. No embryo mortality resulted as long as the eggs were not exposed to fumigation during the first twenty-four to eighty-four hours of incubation.

In general, the technique used by Wright *et al.* was to inoculate sterile egg shells with a drop of broth culture of *S. pullorum*. The shells were placed in wide-mouth containers plugged with cotton except when subjected to fumes in the incubator. At the end of the fumigation period, the shells were cultured to determine the effect of the fumigant.

As a result of their work, they now recommend fumigating the setters with the quantity of formalin previously mentioned but suggest care not to expose eggs to the gas between the twenty-fourth to eighty-fourth hour of incubation, when they are most susceptible to formaldehyde. Hatchers are fumigated after transferring the eggs but before the eggs have been pipped and again after each hatch prior to cleaning the machine.

USE OF PROPYLENE GLYCOL

Because of the objectionable features of formalin previously mentioned and the present uncertainty regarding what constitutes an effective dosage, there appears to be a need for investigating other fumigants. In human medicine, there are favorable reports on the bactericidal properties of propylene glycol and triethylene glycol for the destruction of air-borne bacteria. Since it has been claimed that these products are effective in destroying air-borne bacteria in high dilutions, it was thought that they might be suitable for use in modern forced-draft incubators, which have a relatively rapid rate of air exchange.

For reasons to be mentioned later, triethylene glycol was found to be unsatisfactory for fumigating incubators. Propylene glycol is a clear, colorless, practically odorless, nonirritating, nontoxic, slightly viscous liquid, which is readily obtainable at low cost.

Review of the Literature.—The possibility of sterilizing air by means of germicidal mists or aërosols was reported by Trillat in 1938. The continuous disinfection of air by chemical substances has made progress in this country through the work of Robertson *et al.* They reported that propylene glycol and triethylene glycol provided means for continuous disinfection of air.

They demonstrated that the germicidal action of propylene glycol did not depend, as earlier supposed, upon collision of fluid droplets with air-borne bacteria, but upon condensation of hygroscopic glycol molecules upon air-borne droplets containing bacteria. One gram of propylene glycol dispersed as vapor in 5 or 10 million cc. of air killed pathogenic respiratory bacteria and the virus of influenza in air within a few seconds or minutes.

Puck, Robertson, and Lemon studied the conditions which affect the bactericidal action of propylene glycol vapor on air-borne microorganisms. They found that the chemical agent was more effective when both the total number of air-borne droplets (containing bacteria) and the number of organisms present in the droplets were small. A temperature below 80 F. and an atmospheric relative humidity between 45 and 70 per cent were found to constitute the most favorable conditions for the action of the vapor. They also reported that the minimum lethal concentration of glycol varies with different organisms. Pneumococci were killed by 1 Gm. of propylene glycol in 20 million cc. of air. Concentrations of 1 : 5 million to 1 : 10 million were required to produce the same degree of killing of streptococci and staphylococci.

Experimental Procedure.—One of the first problems to be overcome in using propylene glycol as a fumigant was to develop a method of releasing it at a uniform, controlled and continuous rate. Improvised methods used for releasing the vapor were not satisfactory. Excessive heat alters the chemical composition of propylene glycol, and ineffective by-products are released. Potassium permanganate, when added to propylene glycol, is not satisfactory. It causes a violent reaction and breaks down the glycol into end-products with the formation of smoke.

Propylene glycol vaporizes at about 200 F. Gradually increasing the amount of heat applied to an open vessel does not proportionately increase the rate of vaporization, as might be expected.

A commercial unit provided a continuous, uniform rate of vaporization which could be controlled by regulating the sizes of the infra-red-ray, heat bulbs. It proved to be satisfactory for experimental purposes. One unit was used in small incubators, while as many as three were placed in large machines.

Upon obtaining this satisfactory method of releasing propylene glycol, tests were made in a 1,720-egg capacity, forced-draft incubator in the laboratory and at six commercial hatcheries. Two methods were used to study the effect of propylene glycol on the bacteria count in the incubator. Agar plates were placed in the incubator, and counts were made following ten to thirty minutes of exposure before and after adding the vapor. Longer periods of exposure were not satisfactory due to the drying of the agar. Tests were also made to determine the effect of the glycol upon cultures of an avirulent strain of *Salmonella gallinarum*. Twenty-four-hour broth cultures were added to sterile cotton plugs. The cotton was soaked

with the culture and then removed to sterile Petri dishes. The cotton was sometimes exposed while moist, and on other tests it was allowed to dry for several hours before exposure. The length of time that the plates were subjected to the vapor varied, as shown in table 2, from twelve minutes to nineteen hours.

The cotton plugs were either glued to the Petri dishes or loosely attached to wire gauze. The corners of the wire gauze were turned down slightly so as to elevate the cotton and thus permit the circulation of air beneath the cotton in the Petri dish as described by Godfrey, Buss, and Winters.[3] Three Petri dishes were usually exposed at one time, at various positions in the incubator. Unexposed, inoculated cotton plugs were used for controls. For some reason (perhaps due to dehydration), these control plugs sometimes failed to yield the organism. Similar observations reported by Canadian workers complicate the interpretation of the results obtained.

The cotton plugs were placed in tetrathionate broth following exposure and incubated for twenty-four hours. The broth was placed onto SS agar which was incubated for another twenty-four hours. Typical colonies were isolated onto tryptose agar slopes and incubated for the same period. From the resulting growth, the isolated organisms were identified by studying their reaction on dextrose, dulcite, maltose, lactose, and sucrose. Gram's stain and motility studies were also used as a means of identifying the *S. gallinarum* organisms.

The hatcherymen were asked to operate their machines in the usual manner. Different makes and models of incubators were used, but essentially the temperature and moisture within the incubators did not vary greatly.

EXPERIMENTAL RESULTS

One of the first studies made was to determine the possible toxicity of propylene glycol and triethylene glycol to baby chicks when exposed continuously for two days to the former and one day to the latter. Other chicks were exposed for ten minutes to a mixture of propylene glycol and potassium permanganate. A violent oxidation reaction occurred with the resultant formation of smoke, which probably would have suffocated the chicks if the smoke had not been released from the incubator within ten minutes. Table 1 shows that no harmful after-effects resulted from the use of

TABLE 3—Comparative Efficiency of Incubator Sterilizing Agents

Hatchery & incu. no.	Exposure	Germicidal agent	Culture medium	Bacteria count
E1	15 min.	Sterilamp	Agar	500
E2	15 min.	Sterilamp	Agar	813
E2	15 min.	Sterilamp	Agar	1,500
E2	4 hr.	Sterilamp	Plug	25
E3	15 min.	None	Agar	938
E3	14 hr.	None	Plug	1,208
E4	15 min.	None	Agar	1,000
E4	15 min.	None	Agar	563
E5	30 min.	Propylene glycol	Plug	271
E5	30 min.	Propylene glycol	Plug	830
E5	15 min.	Propylene glycol	Plug	1,500
E5	1 hr.	Propylene glycol	Plug	271
E5	1 hr.	Propylene glycol	Plug	396
E5	4 hr.	Propylene glycol	Plug	8
E5	14 hr.	Propylene glycol	Plug	0
E5	19 hr.	Propylene glycol	Plug	0
M4	11 hr.	None	Plug	1,916
M4	11 hr.	None	Plug	1,562
M5	9 hr.	Propylene glycol	Plug	0
M5	9 hr.	Propylene glycol	Plug	0
M4	3 hr.	Formalin	Plug	0
M4	4 hr.	Formalin	Plug	0
T7	15 min.	Propylene glycol	Agar	373
T7	15 min.	Propylene glycol	Agar	313
T7	2 hr.	Propylene glycol	Plug	542
T7	4½ hr.	Propylene glycol	Plug	28
T7	4½ hr.	Propylene glycol	Plug	1,062
T7	11 hr.	Propylene glycol	Plug	0
T10	15 min.	None	Agar	125
T10	15 min.	None	Agar	88
T10	10 min.	None	Agar	81
T13	10 min.	None	Agar	375
T15	15 min.	None	Agar	53
T15	15 min.	None	Agar	126
T15	4 hr.	Propylene glycol	Plug	583
T15	4 hr.	Propylene glycol	Plug	208
Unexposed control			Plug	979
Unexposed control			Plug	1,729
Unexposed control av. count			Plug	1,354

either of the glycol vapors or the smoke resulting from the propylene glycol and potassium permanganate mixture. The chicks exposed to the propylene glycol and triethylene glycol vapors were closely observed for three weeks in batteries, and those exposed to the smoke were placed in a brooder house and observed for ten days.

Since no references were available on the use of propylene glycol for the fumigation of chick incubators, a great deal of pioneering was necessary. This accounts for the wide variation in the length of exposure to glycol, quantity of glycol released, and the different material used for testing the efficiency of the chemical as shown in table 2. All of the results reported in this table were obtained from incubator-hatcher type of machines.

Fig. 1—Instrument used to vaporize propylene glycol. The quantity of glycol liberated was regulated by the amount of heat generated and the number of units used in the incubator.

In the small machine D, 32 trials were run. In 22 cases, *S. gallinarum* was killed and, in 10, the organism was recovered. Moist cotton plugs were used in 26 of the trials, while cultures dried on glass plates were exposed in six cases. Two other trials were conducted on 8 baby chicks to determine the efficiency of the vapor in destroying cultures when heavily sprayed on the fluff with an atomizer. Negative results were obtained. However, there was an apparent reduction in the number of organisms present on the exposed chicks as compared with the 4 unexposed controls.

A 28,000-egg capacity machine S was used in 15 trials, in which 14 showed no growth of organisms when using dry cotton plugs. The two unexposed control plugs showed heavy growth. The tryptose agar plates exposed for twelve minutes before fumigating the incubator showed ten colonies on one plate and 50 on the other. This indicates that the hatchery sanitation was good.

In machine F, with a capacity of 30,000 eggs, 20 trials were run with cotton plugs. In two of these trials, moist cotton was used and exposed for two and a half hours to the vapor which destroyed the organisms. The remaining 18 dry cotton plugs showed 15 without growth and three with growth. In two cases, 1 cc. of a 24-hour broth culture was exposed for nine and a half hours and the broth, when cultured, yielded *S. gallinarum*. Two tryptose agar plates, when exposed for two hours, showed a light growth of staphylococcus and spreader-type organisms. Longer exposure of agar plates resulted in dehydration of the mediums, and no growth was observed. Two plates exposed for fifteen minutes before fumigating also showed a light growth of staphylococci and spreader-type bacteria. The sanitary practices in this hatchery were good, but apparently the concentration of propylene glycol present in this incubator was not adequate for the destruction of staphylococci and spreader-type organisms.

Machine L1 was a 30,000-egg capacity incubator. Two moist cotton plugs were exposed in it, and growth was obtained on both plugs. In machine L2, which had a 60,000-egg capacity, three trials were run using moist plugs, and growth was obtained in all three samples. Of two dry plugs, one showed growth and the other, which was exposed to vapor for sixteen hours, yielded no growth.

An attempt was made in hatchery E, where separate hatchers were used, to compare the germicidal efficiency of ultraviolet lamps and propylene glycol vapor in which case a 200-watt infrared bulb was used. The results are not conclusive due to the high count obtained in the majority of trials regardless of which method was used.

There was a marked reduction in the bacterial count in both cases when cotton plugs were exposed for four hours, while the organisms exposed for fourteen and nineteen hours to the glycol were killed.

Machines M4 and M5 were 64,000-egg capacity incubators of the incubator-hatcher type. A comparison was made between propylene glycol vapor when using three,

200-watt infrared bulbs and formalin. Plugs exposed for three and four hours to the formalin and for nine hours to the glycol resulted in the destruction of all *S. gallinarum* organisms. Unfumigated controls showed a heavy growth.

Machines T7, T10, T13, and T15 were used to study the efficiency of three propylene glycol vaporizers (200-watt infrared bulbs) in each machine, when placed in these 64,000-egg capacity, incubator-hatcher type of machines. The results of exposing tryptose agar plates for ten to fifteen minutes in these machines showed the bacterial count to be low. There was no apparent decrease in the bacterial count on agar plates exposed while glycol vapors were being released in machine T7, as compared to the other three machines in which no propylene glycol had been released. This again indicates the ineffectiveness of propylene glycol on the destruction of bacteria such as staphylococci and spore-forming types of organisms which are commonly present in chick incubators. Exposure of plugs for eleven hours to propylene glycol resulted in the destruction of *S. gallinarum*. Plugs exposed for two to four and a half hours showed a marked reduction in the number of organisms present. The average bacteria count for the exposed plugs was 485 as compared to 1,354 for the unexposed control plugs.

DISCUSSION

Exposure of moist and dry pledgets of cotton, containing *S. gallinarum* organisms, to propylene glycol resulted in the destruction of the organisms in all of the different makes and sizes of incubators studied. There was a marked variation, though, in the effectiveness of the glycol vapor in different incubators. With the limited amount of work done, it is not possible to state the cause for this variation but, as was previously stated, the temperature, relative humidity, rate of air exchange, volume of air, number of air-borne droplets (containing bacteria), number of organisms in the droplets, and the species of bacteria present are all factors to be considered.

Our experimental work indicates that staphylococci are more resistant to propylene glycol than *S. gallinarum*.

Triethylene glycol has been reported to be highly effective in low dilutions against air-borne bacteria, but it did not prove to be satisfactory as an incubator fumigant. The triethylene glycol vapor condensed before it reached sufficient concentration to possess effective bactericidal action under the conditions prevailing in chick incubators. A bactericidal concentration of propylene glycol covers a greater range and is more readily obtained in incubators and, therefore, is the preferred glycol for this use.

Propylene glycol could not be effectively liberated by the use of potassium permanganate. A violent oxidation reaction occurred that resulted in the formation of clouds of smoke which had no lasting injurious effect upon exposed chicks, but which could accumulate in incubators in sufficient quantities to cause asphyxiation of the exposed chicks.

CONCLUSIONS

The physical and chemical properties of propylene glycol make it a suitable product for the fumigation of incubators. Studies to date indicate, however, that it is not as effective as formalin in destroying certain bacteria, particularly staphylococci and spore-forming organisms. Additional work may prove it to be an effective chemical agent to prevent disease transmission during the hatching period when formalin must be used with extreme caution due to its toxicity to chicks a few hours after hatching. Further field work will be necessary to determine its true status as an incubator fumigant.

DISCUSSION*

DR. GWATKIN.—I am interested in Dr. Moore's work because, for the past six months, we have been trying this, and we have run 100 tests, mostly with triethylene. Having noticed in the literature that triethylene was more effective for air, we switched to it, although that may have been a drawback.

At the present moment, our scale is much less ambitious for an incubation. I am just using an ordinary "lab" incubation. We put on a wooden door and made holes in it to blow the gas through and we have been liberating it by heat. Will the boiling destroy it?

DR. MOORE.—What is the heat?

DR. GWATKIN.—We put it right on a hot plate. It boils.

DR. MOORE.—Chemists tell me that propylene glycol can be broken down into end products.

DR. GWATKIN.—It is definitely broken down by dropping it on a hot plate. The clouds of smoke contain nothing at all. How is this stock actually put in? We have used a Florence flask and lately have introduced an air jet into it. When it boils, it starts off, drops back, spurts, and the cloud is over all. We found that by pumping air into the flask we get clouds of smoke that not only fill the

*After the presentation of the paper, a brief discussion followed.

incubator but also the room. In spite of that, our results have not been good. I haven't yet been able to sterilize shells in the incubator. In an ordinary dessicator jar, we get splendid results on the shell. We started to use shell and then a piece of heavy string dipped, and also soaked pieces of Sykes filter pad. We succeeded in the jar, but not in the incubator. We tried different temperatures, humidity, and so on. Was there something wrong with our method of applying it?

DR. MOORE.—Perhaps, Dr. Gwatkin, the moisture in the jar is higher than in the incubator. Is that true?

DR. GWATKIN.—Of course, there may be more moisture in a small jar, yet when the room gets filled with the vapor, one wonders. We have made about 100 tests.

I would like also to mention a thing of interest to me. We started, as in the old days, with pieces of sterilized shell, spread 24-hour broth upon it, let it dry, and when exposed, we got no growth from some of the control pieces after four or six hours. When we put some of those pieces of shells right into a tube of broth after six hours, we got no growth in some instances.

DR. MOORE.—That is a possibility in four hours with some cultures. There appear to be some beneficial results from exposures over a long period.

DR. GWATKIN.—We were getting results with cold glycol put on the floor of the warm incubator. We were doing well. We had no outside control. When checked, there was exactly the same percentage of control outside that hadn't been near the glycol. We then took them into another room.

DR. MOORE.—We are hardly ready to recommend it, but this commercial product is now the most satisfactory one I have found next to formalin. You'll be interested in seeing this vaporizer.

DR. GWATKIN.—What is its purpose? Is heat applied?

DR. MOORE.—Yes, heat is applied to glass wicks. The number of wicks and the amount of heat given off is regulated.

DR. GWATKIN.—Not boiled?

DR. MOORE.—No, it isn't boiled. I think that that is probably the most important feature about this work. We tried boiling on an electric hot plate and put light bulbs under it in various ways and then measured the quantity of propylene glycol vaporized over a period, and thus found this commercial vaporizer far more effective.

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Clipping the udder and wiping it with a warm chlorine solution helps to lower the bacteria content of milk.

Describes a New Canine Distemper Vaccine

At the March 2 meeting of the Society of Veterinary Science of Lyon (*Rev. d. Méd. Vét., 98,* Apr., 1947: 172-173), M. Goret described a canine distemper vaccine prepared simply with hydroxide of aluminum and dried by the Mudd-Flosdorf method in a vacuum. The injection of 40 mg. in 2 cc. of the medium conferred solid immunity against the virus disease in 500 ferrets and 25 dogs. The virus-hydroxide is very labile and permits the hydroxide to mask the virus, but after taking up water, the virus, *in vivo*, though still labile, assures immunity without conferring infection. A later report concerns 1,717 vaccinated dogs among which there was failure in 15 per cent. The failures were attributed in part to the unusually high virulence of Carré's virus in recent years.

Vaccination Excluded from Foot-and-Mouth Disease Eradication in Mexico

According to a USDA release dated Apr. 29, 1947, plans agreed upon by the Mexican and United States governments for the suppression of foot-and-mouth disease in Mexico call for "the drastic but time-tried methods of quarantine and slaughter of affected and exposed animals, followed by thorough cleaning and disinfection of premises." Officials also have agreed to exclude the use of vaccines. Although known to be of some value in relieving the effects of the infection in countries where foot-and-mouth disease is firmly established, vaccines have no place in a program such as that being carried on in Mexico where early and complete eradication is the goal, the Department said. Emphasis will, therefore, be placed on a concentration of efforts to attain that goal.

Officials also stated that the U. S. Department of Agriculture has been deluged with proposals and inquiries regarding so-called "cures" for foot-and-mouth disease. None of these cures have been found to be effective and, furthermore, the time lost by their use would result in further spread of the virus, thus hindering the eradication work and making it more expensive.

A Case of Ossification of the Bovine Lung

W. S. BAILEY, D.V.M., M.S.
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ALTHOUGH ossification of the bronchial cartilages and of tubercular or other pulmonary lesions is relatively common, diffuse forms of ossification are rare. According to Wells and Dunlap,[1] Manzini *(Riv. di pat. e clin. d. tuberc.*, 1938, Bologna, Italy) reviewed the literature to 1938 and found 43 cases reported in man, and 2 more cases were reported before their single case report in 1943. Of the cases recorded in the literature, the one by Wells and Dunlap was the first in the English language; all the others were in German, French, or Italian. Grisham and Kane[2] reported 8 cases of disseminated nodular calcified deposits and ossification associated with mitral stenosis and insufficiency.

The diffuse type of pulmonary ossification occurs in two forms, racemose or branching and nodular circumscribed. The former is by far the more common and consists of branching spicules of true bone running in the interalveolar septums of the lung. These may be continuous for some distance but have isolated spicules. The pathogenesis of this pulmonary lesion is not clear. In the opinion of Wells and Dunlap,[1] the best explanation is that of Daust who stated that it appeared to be a metaplasia due to senile alterations in the perivascular connective tissue. The assumption is that the vascular medium degenerates and the perivascular connective tissue swells greatly and become hyaline. Short compressed nuclei with dendritic processes appear in the hyaline tissue and apparently form osteoid tissue which becomes calcified with bone formation. They[1] state further that marrow formation is occasionally observed in the new bone but, apparently, that is much more rare and sparse than is commonly found in bone resulting from calcification of tuberculous scars or ossified bronchial cartilage. According to them, and as illustrated by Grisham and Kane,[2] the nodular circumscribed form chiefly affects relatively young persons with mitral stenosis and seems to be the result of connective tissue proliferation in organizing the transudate due to chronic passive congestion.

The case reported herein resembles the racemose type found in man, and, as far as I was able to determine, is the first report of this condition in a domestic animal.

Fig. 1—Histopathologic picture of spicules of ossification in the lung tissue. x 85. (Negative 98891, Army Institute of Pathology.)

From the Department of Bacteriology and Pathology of the Alabama Polytechnic Institute, School of Veterinary Medicine, Auburn.

The writer is indebted to Drs. B. N. Lauderdale, F. M. Welch, and H. L. Herchenroeder of the Bureau of Animal Industry for the specimen for study; to the personnel of the Army Institute of Pathology (Registry of Veterinary Pathology) for examining the tissue microscopically and preparing the photographs; and to Drs. A. A. Leibold and T. C. Fitzgerald of the A.P.I. School of Veterinary Medicine for their advice and assistance in preparing this report.

The lung in which this lesion was observed was that of a steer of unknown age and breed from Texas, sent through a federally inspected sale yard in Montgomery, Ala., for immediate slaughter. The animal was condemned on antemortem inspection due to extreme emaciation. On postmortem examination, the lungs were found to be hard and inelastic. One lung was brought to the School of Veterinary Medicine for examination. The inspector stated that the associated lymph nodes and the remaining viscera appeared unaffected. On gross examination, the lung was found to be diffusely ossified. The major portion was affected, with only small areas—mainly in the anterior lobes—retaining the normal appearance and consistency. The affected portion was pale and greyish white. The lung could be cut without great difficulty and, on the cut surfaces, innumerable small spicules of bone could be seen and felt.

Fig. 2—Higher magnification of an area of ossification. x 130. The alveolar walls are greatly thickened as a result of the ossification. (Negative 98895, Army Institute of Pathology.)

Microscopically, islands of bone were scattered throughout the lung (fig. 1 and 2). These were located mainly in the interalveolar septums, causing marked thickening and consequent compression of adjacent alveoli. Many septums in which ossification had not occurred showed slight thickening as the result of exudative and proliferative changes. Extravascular erythrocytes and small numbers of hemosiderin-containing phagocytes were present. In many alveolar spaces, fibrin was found in slight to moderate amounts. Some alveoli showed atelectasis while others showed a compensatory emphysema. In the islands of bone, osteocytes were numerous, but osteoblasts were lacking and no osteoclasts were seen. Relatively uninvolved alveoli were found adjacent to the bronchioles and their accompanying vessels, suggesting that the ossification was more extensive distal to the vessels.

SUMMARY

A case of disseminated ossification of the bovine lung due to unknown cause is presented. This is similar to the racemose or branching type of diffuse pulmonary ossification in man.

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New Antibiotic from Bikini

Streptomyces II bikiniensis, reported by Dr. D. B. Johnstone of the New Jersey Agricultural Experiment Station, was credited by the public press as being "twice as powerful as streptomycin," but this statement is corrected in a release direct from New Brunswick.

What was actually reported to the Society of American Bacteriologists was that the new strain did show some promise *in vitro* in checking the growth of a nonpathogenic strain of *Mycobacterium tuberculosis.* As the letter of transmittal with the corrected release points out ". . . this is a far cry from curing tuberculosis in humans."

Penicillin Therapy in Streptococcal Mastitis

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THE CONTROL of bovine mastitis is of economic importance to dairymen, and it is also important in public health and sanitation, since it directly affects the production of sanitary, wholesome milk. Much progress has been made in recent years in the control and eradication of this disease through the development of accurate methods of diagnosis and the discovery of a number of chemotherapeutic agents which show promise for its treatment.

Results previously reported[1] indicated that intramammary infusion of penicillin was effective in the treatment of streptococcal mastitis. Other reports have supported this conclusion. However, the optimum dosage and number of infusions have not been finally established.

Review of Literature

Bryan, Horwood, and Huffman[2] reported good results in the treatment of chronic streptococcal mastitis when one to three infusions of 1,000 to 12,500 units of penicillin were administered per quarter. Murphy and Pfau[3] found that the administration of five doses of 20,000 units at each milking period cured *Streptococcus agalactiae* infection in all 32 quarters of 13 cows treated. Five doses of 10,000 units or one dose of 5,000 to 200,000 units were not as satisfactory in the limited number of quarters tested. Johnson and Fincher,[4] in an extensive study of various doses, treated 213 cows with chronic, subacute, acute, or septic mastitis in 316 quarters. They concluded that the optimum dose appears to be 25,000 to 100,000 units in 10 to 50 cc. of sterile distilled water given at least three times. Porter *et al.*[5] treated 240 quarters of 120 cows infected with *Str. agalactiae*, using various doses. Cows not recovering after the first injection were treated a second and a third time. The quarters restored to normal by 1,000 units averaged 47 per cent; 5,000 units, 50 per cent; 10,000 units, 60 per cent; 15,000 units, 73 per cent; 30,000 units, 70 per cent; 50,000 units, 63 per cent; and 100,000 units, 73 per cent, respectively. With one exception, there was a trend toward a higher percentage of recoveries as the dose was increased. Byrne, Pullin, and Konsk[6] obtained best results in streptococcal mastitis when they employed from one to six treatments at four-day intervals of 40,000 units in 100 cc. of sterile physiologic saline. In all of the above studies, the penicillin was dissolved in sterile distilled water or saline and infused into the udder in volumes ranging from 10 cc. to 500 cc. Porter and Kelman[7] found no significant difference in the percentage of quarters restored to normal when either 10, 100, or 500 cc. of sterile distilled water were used as a vehicle.

The present paper reports the results of further studies on the treatment of streptococcal mastitis with penicillin. A special effort was made to determine whether one infusion of a large dose would produce recovery of this type of mastitis, since such a method would make more practical the treatment of this disease. The results of preliminary studies on the use of sulfamethazine in the treatment of streptococcal mastitis are also included.

Methods

The cows treated in this study were from 14 typical New Hampshire dairy herds. Two or more tests at one-week intervals were made on quarter samples collected aseptically from each cow before treatment was administered. Diagnosis was based on microscopic examination of incubated samples and cultural tests. All incubated samples showing streptococci were inoculated onto Edwards' medium, and the streptococci isolated from this medium were identified by use of selected biochemical tests.

In most cases, no attempt was made to select particular cows in the herds for treatment. Records were made of the amount of udder induration, the physical appearance of the milk, and the period of infection. The cows treated had either the chronic, subacute, or the acute type of mastitis. Only lactating cows were treated, and no cows with acutely swollen quarters were included.

The dose of penicillin (sodium salt) was dissolved in 100 cc. of sterile distilled water and infused into the quarter by gravity flow. A sterile intravenous apparatus connected to a teat cannula was used. All infusions were made immediately after milking the quarters dry. When more than one infusion was given, the treatments were made at 24-hour intervals. The cows were milked twelve hours after treatment or, in a few cases, twenty-four hours after treatment. Doses ranging from 20,000 to 400,000 units were tested. Cows were considered recovered when no mastitis streptococci could be detected in quarter samples examined as

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All of the penicillin and sulfamethazine used in these studies was supplied by Lederle Laboratories, Pearl River, N. Y.

described above and taken one, two, and four weeks after treatment.

RESULTS

A total of 218 cows with streptococcal mastitis in 439 quarters were treated. *Str. agalactiae* was isolated from 435 of these quarters, *Streptococcus fecalis* from three quarters, and *Streptococcus dysgalactiae* from one quarter. The dose of penicillin, the number of infusions, the number of cows treated, and the results obtained are summarized in table 1. Except in the case of those cows treated with one infusion of 300,000 or 400,000 units or two infusions of 200,000 units, no attempt was made to select the animals to be treated in the different herds. Thus, some herds had more acute or more long-standing, chronic mastitis than others, which factor influences the percentage of recoveries obtained by any given method. These studies indicate that one, two, or three infusions of the smaller amounts restored to normal all of the mild, chronic cases of mastitis. The cases not recovering were those cows with acute or chronic mastitis where the infection had been present for a considerable period, and induration of the udder had developed. Three infusions of 20,000, 75,000, or 100,000 units at 24-hour intervals were more effective in these cases than one injection of 100,000 units or two injections of 50,000 or 75,000 units.

When one infusion of 300,000 or 400,000 units and 2 infusions of 200,000 units were administered, the cows selected for these tests showed the acute or the long-standing, chronic type of mastitis. This probably explains the lower percentage of recoveries obtained when one infusion of 300,000 units was administered as compared to the 200,000-unit dose. One infusion of 400,000 units gave a high proportion of recoveries in the cases of acute or chronic mastitis treated, and the results were as good as, or better than, the results obtained when three injections of 20,000 to 100,000 units were given. Two injections of 200,000 units were less satisfactory.

To obtain further information on the effectiveness of one injection of 400,000 units, a so-called problem herd was selected for study. The value of sulfamethazine together with penicillin was also studied in this herd. The herd contained 53 milking cows, 24 of which had *Str. agalactiae* mastitis in a total of 56 quarters. Twelve of the quarters were giving stringy or discolored milk, and 45 of the quarters showed marked fibrosis. Cases of acute mastitis with swollen quarters had appeared repeatedly in this herd.

Sixteen of the cows were treated in 42 quarters with one infusion of 400,000 units per quarter. Twelve of these cows were milked at the next twelve-hour milking period, and 4 cows were not milked until twenty-four hours after treatment. Eight cows with streptococcal mastitis in 14 quarters were given one infusion of 200,000 units of penicillin dissolved in 100 cc. of 10 per cent sulfamethazine. Thus, each quarter received 10 Gm. of sulfamethazine in addition to the penicillin. All of these cows were milked twelve hours after treatment.

The results obtained are given in table 2. Ten of the 12 cows (83.3%) and 30 of the 33 quarters (90.9%) treated with one infusion of 400,000 units of penicillin re-

TABLE 1 — Results of Treatment of Streptococcal Mastitis with Different Dosages of Penicillin.

No. infusions*	U. penicillin	No. cows treated	No. recovered	%	No. Q. treated	No. restored to normal	%
1	100,000	46	29	63.0	92	66	71.7
1	200,000	38	32	84.4	65	54	83.0
1	300,000	13	9	69.2	24	16	66.6
1	400,000	9	8	88.8	17	15	88.2
2	50,000	19	12	63.1	50	38	76.0
2	75,000	16	10	62.5	33	27	81.8
2	200,000	9	5	55.5	25	17	68.0
3	20,000	37	32	86.4	77	70	90.9
3	75,000	21	18	85.7	38	35	92.1
3	100,000	10	8	80.0	18	15	83.3

*The penicillin was infused into the quarters in 100 cc. of sterile distilled water, and cows were milked about twelve hours after treatment. When more than one infusion was administered, the injections were made at 24-hour intervals.

TABLE 2—Treatment of Streptococcal Mastitis with One Infusion of 400,000 Units of Penicillin and with Penicillin plus Sulfamethazine.

Milking interval	U. penicillin	No. cows treated	No. recovered	%	No. Q. treated	No. restored to normal	%
12 hr.	400,000	12	10	83.3	33	30	90.9
24 hr.	400,000	4	4	100	9	9	100
12 hr.	200,000 + 10 Gm. sulfamethazine	8	8	100	14	14	100

turned to normal. These cows were milked twelve hours after treatment. The quarters not restored to normal showed marked fibrosis or discolored milk before treatment. All 4 cows and nine quarters which were not milked until twenty-four hours after treatment were cured with one infusion of 400,000 units of penicillin. Excellent results were also obtained when quarters infected with *Str. agalactiae* mastitis were treated with 200,000 units of penicillin and 10 Gm. of sulfamethazine in 100 cc. of sterile water. All 8 cows (14 quarters) recovered. Cows with discolored milk and marked fibrosis were included in each of the three groups receiving different treatments. Immediate improvement was noted by the herdsman in the mastitis condition of this herd. No toxic effect or marked reduction in milk production was observed in any of the cows treated.

As long as infected animals remain in the herd, careful programs of segregation and herd management must be practiced to prevent reinfection of cows that have recovered by treatment.

SUMMARY AND CONCLUSIONS

A total of 243 cows with streptococcal mastitis in 495 quarters were treated with various doses of penicillin. Eight cows in one herd were treated with both penicillin and sulfamethazine.

One infusion of 100,000 units of penicillin was required in mild, chronic cases of streptococcal mastitis. Larger doses or several infusions of from 20,000 to 100,000 units were necessary for recovery with the acute or the long-standing, chronic type of streptococcal mastitis. These cows usually had considerable udder fibrosis or were giving discolored or stringy milk. A number of cows with this type of mastitis did not recover with three infusions at 24-hour intervals of from 20,000 to 100,000 units per quarter.

One infusion of 400,000 units gave excellent results, and this method is as effective as the administration of several infusions of smaller doses.

Highly satisfactory recoveries were also obtained when infected quarters were given one infusion of 200,000 units of penicillin and 10 Gm. of sulfamethazine dissolved in 100 cc. of sterile water. Further study of the combination of these two agents for the treatment of bovine mastitis is warranted.

Streptococcal mastitis can now be controlled and eradicated from a dairy herd if proper methods of diagnosis, therapy, and herd management are employed.

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The New Drugs

The eventful ten years of medicine just past are only beginning to be understood in regard to the revolutionary changes they brought into the practice of medicine. Entirely apart from the now well-known and widely used antibiotics and sulfonamides, there has come into the medical horizon a large group of natural and synthetic chemicals affecting the hormonal, enzymic, and synthesizing mechanisms of the living body in health and in disease. Among them are:

vitamin K	dicoumarol
caffeine	curare
fluorescein sodium	histamine
benadryl	pyribenzamine
mecholyl chloride	neostigmine
metrazol	pitressin
placental extract	gonadotropin

Also bismuth paste, barium sulfate, and numerous other chemicals are used in x-ray work. The above named drugs are but a few samples which are replacing the old in the modern doctor's arsenal. They differ from the old drugs of the pharmacopoeia, in general, in that their action on given biological processes is the basis for their use. They are making the old books older.

Stop-watch statistics show that a cow will not graze more than eight hours in one day.

An Outbreak of Acute Bovine Listerellosis

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NUMEROUS articles have been published on the subject of listerellosis, and the usual symptoms observed have been well described. [1, 2, 3, 4] However, no report has come to our attention which concerned a naturally occurring outbreak having the clinical picture described herein.

Diseases not commonly observed may readily go unrecognized and even unsuspected when descriptions of clinical and postmortem manifestations are incomplete. Because of this fact, we are reporting several unusually acute cases of listerellosis in a small herd of beef cattle.

The outbreak occurred in a herd of 27, 3- to 4-month-old, purebred and crossbred Aberdeen Angus calves nursing their dams. Until Oct. 10, 1946, they had been on a permanent bluegrass pasture used solely by this herd. On this date, they were moved to another farm approximately a mile away and mixed with another similar group. In making the change, the herd was driven through a field and held in the adjacent barn and yard for a few minutes while being loaded in trucks. The latter premises had been occupied previously by a flock of sheep, although none were there with the cattle. Cases of listerellosis had been known to occur in this flock over a period of several years. The causative organisms had been isolated from a limited number of affected sheep in 1942,[5] and the 2 most recently diagnosed cases had occurred early in the summer of 1946.

Two calves were found dead in the home pasture, to which they had been moved, on the evening of Oct. 17, 1946. Another died the following morning, a fourth the next morning, and 4 more by the morning of October 21, making a total of 8 head, or almost 30 per cent. The first noticeable sign observed in any of the calves was a slight dullness. Within an hour, they would bellow as though in severe pain, turn around, fall to the ground, go into convulsions, and die within a few minutes. Almost every calf in the group was noticed to have mild conjunctivitis on October 21, which was the last day that deaths occurred. One of these calves having conjunctivitis had a temperature of 106 F. A temperature of 108 F. was recorded for 1 of the earlier cases at the time of death. The seventh calf to die had a temperature of 102.6 F. when first noticed to be somewhat dull. Although immediately given a blood transfusion, sodium sulfathiazole intravenously, and sulfanilamide orally, it died four hours later.

The lesions noted at autopsy of 3 of the first 6 calves to die were petechial and ecchymotic hemorrhages in heart tissues, especially the pericardium and epicardium. Visible liver changes were practically absent. Limited areas on these organs appeared to be slightly lighter in color and somewhat more friable than normal. Petechial and ecchymotic hemorrhages varying from 1 to 5 mm. in diameter, were scattered throughout the kidneys. Those calves which died later showed these same lesions and also marked hyperemia and edema of the anterior half of the lungs. The hyperemic areas in the lungs of 1 calf which had died several hours before the autopsy were also somewhat emphysematous. A section of the small intestine, about 6 mm. long, in the fifth calf to die was edematous and hyperemic in a manner to suggest that a temporary intussusception had been present prior to death. The meninges were slightly inflamed in the 1 head examined and cultured.

Mediums were inoculated with material of the brain, heart, lungs, liver, and kidney of the sixth calf to die. Small gram-positive rods, which had the characteristics of *Listerella monocytogenes* when cultured on various differential mediums, were obtained from the brain tissues and fluids. All other materials were sterile, except that from the lungs which contained a few colonies of various organisms of questionable significance. These were of the types commonly observed when inhalation of vomitus occurs at the time of death.

Dairy (Pounden) and Animal Industry (Bell) Departments, Ohio Agricultural Experiment Station, Wooster, and practitioner (Mairs), Wooster.

The authors acknowledge the assistance received from Dr. B. H. Edgington and Dr. F. R. Ewing on this investigation.

DISCUSSION

The peracute cases which first succumbed gave little indication of the cause of death. Furthermore, the history was confusing. Poisoning was suggested as a possibility by the fact that these calves had left the pasture during the evening of October 16 and had passed through an apple orchard where sprays had been used. Besides this, these animals recently had been trucked and otherwise moved around, which was sufficient to draw attention to the feasibility of hemorrhagic septicemia being involved.

While it seems unlikely that merely driving cattle through infected premises would cause such an outbreak, this appears to be the only explanation. It is interesting to note that the disease was not immediately transferred to the animals in the herd with which they were mixed and that older animals were not involved whatsoever. Whether this indicates that mental disturbance concomitant with the moving and mixing with other cattle influenced the outcome can only be speculative.

SUMMARY

An outbreak of listerellosis in beef calves is described in which the cases were extremely acute. Of the 27 animals in the herd, 8 of them died and the majority of the remainder suffered from mild attacks of conjunctivitis. The possibility exists that the disease was contracted on premises previously occupied by sheep, some of which had suffered from this disease.

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Sow Testing Plan.—The value of a sow should be measured by the pounds of offspring she weans at eight weeks after farrowing, says *Successful Farming*, which reports that this sow testing plan is being used more widely than the Babcock test for butterfat produced by dairy cows.

Clinical Mutation of Canine Distemper

The radical change of diet forced upon dogs since the German hecatombs of 1940, plus a suspected mutation of Carré's virus as a consequence, has caused canine distemper to take on a remarkable change in its usual manifestations. The abundant nasal discharge, bronchopneumonia, and profound systemic depression have almost completely disappeared, and digestive disorders that are refractory to the habitual treatment and neurotropism have superseded them in the majority of cases. Often the attack starts with epileptic fits and dementia of variable degrees. Local, group, and general myoclonus of rhythmic character and precocious ataxia soon follow. Transverse myelitis (lumbar paralysis) is rare. It is a new clinical tableau suggestive of a new specific virus comparable to that of poliomyelitis (infantile paralysis) but for ample proof that the causal agent is the virus of Carré, as usual.

The nervous character of the disease has led to the use of nonspecific protein therapy once widely employed for nervous affections for which there is no specific biological or chemical treatment; for example, killed cultures of staphylococci and *Bacillus prodigiosis* which in tiny doses of 1/200 cc. intravenously have been known to exert a remarkable favorable action on neurotropic infections. Special preparations, given in obedience to a stated schedule of dosage, have replaced the former medical treatment of canine distemper in France according to the authors' report.—*Rec. Méd. Vét., March, 1947.*

Postmortem Examination Pays.—Contagious diseases often pick off a single animal before herd trouble appears. Recognizing this fact, *Successful Farming* advises its readers (March, 1946) that whenever any animal dies of an unexplained cause it is always a good investment to have a thorough postmortem examination by an experienced veterinarian. Quick identification of an animal dead of hog cholera, blackleg, anthrax, or other contagious disease permits blocking the further spread of such trouble.

The new weed killer 2,4-D has been found to be relatively harmless to fish in controlled experiments carried out by Wall and Harrison, research consultants of Philadelphia.

Studies on Bovine Mastitis
IV. The Incidence of Streptococci in Milk Samples from 12,077 Dairy Cows

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IN APRIL, 1944, a bovine mastitis control program was initiated in Illinois by the extension service of the College of Agriculture. This program was designed as a war-emergency measure to increase milk production. Seven preliminary organization meetings were held for dairymen in the principal milk-producing areas of the state to explain the salient features of mastitis control and to afford dairymen the opportunity to enroll their herds in the program. More than 2,800 dairymen attended these meetings. Following the meetings, field veterinarians were stationed in seven milk-producing areas to work with dairymen and practising veterinarians (fig. 1).

A total of 731 dairymen residing in 44 counties enrolled their herds and received instructions on mastitis prevention and control. The essentials of the program, including herd management, early diagnosis, and treatment, were set forth in a mimeographed leaflet placed in the hands of the dairymen to supplement the instruction given to individual coöperators. The program also included more than 100 barn meetings during the winter months of 1944-1945 and 1945-1946 to demonstrate approved methods in prevention and control of infectious mastitis. Approximately 3,600 dairymen attended these barn meetings.

In connection with herd inspection and instruction to dairymen, more than 62,000 milk samples were collected from 12,077 cows for bacteriologic examinations. Following three monthly bacteriologic examinations of milk samples, laboratory tests were made on milk samples from coöperating herds at intervals of three to four months. The results of these examinations were employed in appraising the progress of mastitis prevention and control in different herds. We herewith report the incidence of streptococci found in milk samples from 12,077 cows of 731 Illinois dairy herds before introduction of mastitis prevention and control measures. These data will be referred to in subsequent publications on mastitis prevention and control.

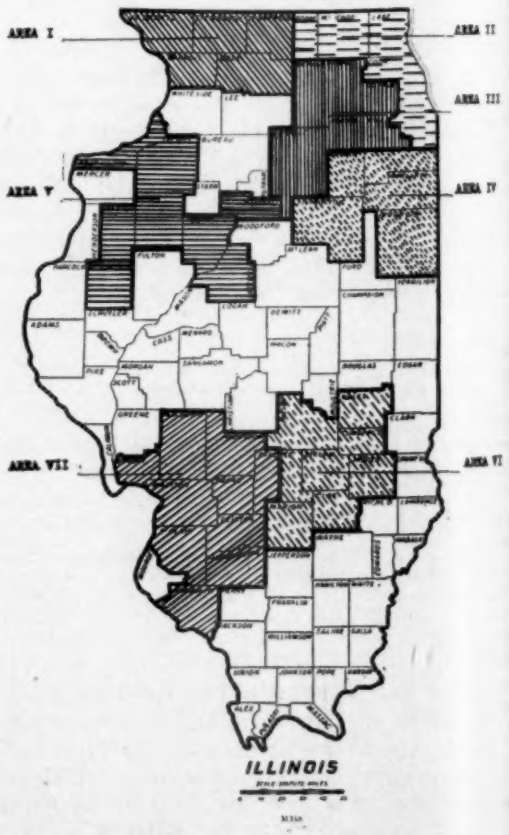

Fig. 1—Area map of Illinois.

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The authors are indebted to Dean Robert Graham for his advice and stimulating interest in initiation and supervision of the Illinois Mastitis Control Program. The authors also thank Professors C. S. Rhode and J. G. Cash of the Dairy Husbandry Department for their suggestions and field contacts. Acknowledgment is due Drs. P. D. Beamer, F. L. Brown, D. P. Gustafson, L. A. Hill, C. B. Hostetler, O. K. Matthews, W. J. Mendenhall, D. W. Schutz, W. R. Shaw, C. E. Thomas, R. M. Thomas, Monte Trimble, and G. E. Whitmore, who served as field veterinarians in the program.

Field Methods

Milk samples were collected for bacteriologic examination immediately preceding the regular milking time. Each cow was prepared for milking by washing the udder, teats, and teat orifices with individual towels which had been soaked in a warm chlorine solution (130 F. and 200 p.p.m. available chlorine). One or two streams of foremilk from each teat were directed into a strip cup and examined for visible abnormalities. A composite sample, approximately 2 to 4 cc. from each quarter, was collected in a sterile vial containing a solution of sodium azide, brilliant green, and dextrose.[1] Milk samples were identified by corresponding tube and record sheet numbers (fig. 2), and placed in a mailing carton together with the field record sheets. All samples were sent by parcel post or express to the laboratory of the College of Veterinary Medicine.

In collecting milk samples, a method approaching an aseptic technique was employed to prevent contamination. Extraneous organisms markedly reduced the efficiency of the microscopic and cultural examinations employed. Refrigeration of samples during the interim between collection and arrival at the laboratory did not aid materially in providing satisfactory samples for laboratory examination.

Physical examination of the udder, when employed, was conducted immediately after milking. Classification of udder abnormalities was not attempted; however, evidence of any detectable induration was noted on the field record. In some herds the bromthymol blue test was demonstrated to the dairymen.

Laboratory Methods

Preparation and microscopic examination of milk films were made with slight modifications, according to the procedures of Bryan, Mallmann, and Turney.[3] The results of the microscopic examination of milk samples were grouped as follows: (1) samples which contained streptococci were considered positive; (2) samples containing leucocytes in excess of 1,000,000 per cc. and in which no streptococci were found were classified as suspicious; (3) samples were regarded as negative when neither leucocytes exceeding 1,000,000 per cc. nor streptococci were observed. On the field record sheet, the subnumbers placed at the lower right of a positive or suspicious symbol (+ or S) refer to the approximate number of leucocytes per cc. in the milk sample, *i.e.*, 0 = less than 1,000,000; 1 = 1,000,000 to 2,000,000; 2 = 2,000,000 to 4,000,000; 3 = in excess of 4,000,000 (fig. 2). Milk samples containing large numbers of extraneous microorganisms were considered to be contaminated and have not been included in the results.

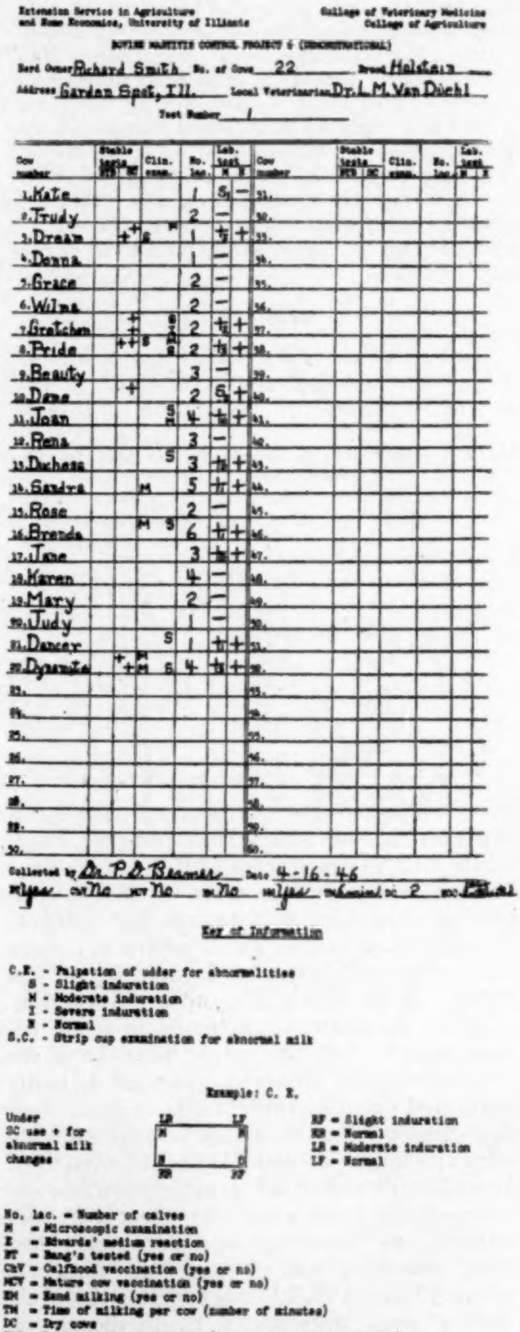

Fig. 2—Field record.

Milk samples which contained streptococci in the microscopic examination were streaked on Edwards' agar plates.[3] The value of this medium is based on its aid in colony differentiation of certain species of streptococci and on its selective action. A proportionately small number of strains of streptococci do not grow on Edwards' agar medium. Since samples which showed leucocytes in excess of 1,000,000 per cc. on microscopic examination may contain streptococci in too small numbers for detection, all samples containing leucocytes in excess of 1,000,000 per cc. were streaked on Edwards' agar plates.

RESULTS

Milk samples from 12,077 cows in 731 herds representing approximately 1 per cent of the dairy cow population of Illinois were examined for streptococci during a two-year period. In initial tests of composite milk samples from 12,077 cows, streptococci were found in 4,688 (38.8%) samples as judged by microscopic and cultural examinations (table 1). Streptococci were present in milk samples from cows of 694 (95%) of the 731 herds under observation.

TABLE 1—Incidence of Streptococci in Milk Samples from 12,077 Cows

Area	No. herds	No. cows	Streptococcus-positive milk samples No.	%
I	156	2,598	980	37.8
II	114	2,489	1,079	43.4
III	102	2,276	957	42.1
IV	105	1,488	577	38.8
V	90	1,229	473	38.5
VI	76	712	212	29.8
VII	88	1,285	410	31.9
	731	12,077	4,688	38.8

While no attempt was made to select cooperators in this project, a measure of selection probably occurred inasmuch as many dairymen enrolled their herds because "udder trouble" was causing increasing concern. In areas II and III, an incidence of streptococci somewhat greater than the average of 38.8 per cent was observed. Conversely, an incidence of streptococci less than the observed average was noted in areas VI and VII. In order to test the probability area differences in incidence occurred by chance, Chi-square values were calculated for areas II, III, VI, and VII and were significant, *i.e.*, the variation in incidence of streptococci in these areas was not due entirely to chance. Such factors as tenant herdsmen rather than owner herdsmen, replacement of cows by purchase instead of within the herd, number of cows in the herd, differentials in the amount of labor employed per cow, and climatic conditions were noted in the different areas and may have influenced the incidence of streptococci.

A group of 316 milk samples regarded as suspicious on the microscopic examination were cultured on Edwards' agar medium. Streptococci were isolated from 66 (20.6%) of these samples. These results suggest that streptococci were present in the milk samples in small numbers and were not detected in microscopic examination.

The strip-cup test showed visibly abnormal secretions from 1,141 cows. Microscopic and cultural examinations revealed streptococci in 836 (73.2%) of these samples. Palpable indurations were reported in the udders of 504 cows. However, due to the fact that udder palpation was not conducted on all cows in this study, the incidence of mammary indurative changes was not determined. Streptococci were found in 289 (57.1%) milk samples from animals with known udder indurations.

Many cows which did not show evidence of clinical mastitis at the time of examination, but which did have streptococci in the milk, may have had symptoms in the interim between examinations. Daily records were not available on these cows. Hence, classification of cows as positive for streptococcic mastitis was not attempted on the basis of the presence of streptococci in milk samples as judged by microscopic and cultural examinations.

TABLE 2—Incidence of Streptococci in Milk Samples Which Contained Leucocytes in Excess of or Less than 1,000,000 per Cc.

Area	No. cows	Streptococcus-positive milk samples: Leucocytes in excess of 1,000,000/cc. No.	%	Leucocytes less than 1,000,000/cc. No.	%
I	2,598	623	23.9	357	13.8
II	2,489	657	26.4	422	17.0
III	2,276	521	23.3	436	19.8
IV	1,488	309	20.8	268	18.0
V	1,229	180	14.6	293	23.9
VI	712	146	20.5	66	9.3
VII	1,285	204	15.9	206	16.0
	12,077	2,640	21.9	2,048	16.9

Different workers have used the presence of leucocytes in milk to indicate inflammation of the mammary tissue, but the critical

level of significance in number of leucocytes has not been established. Halversen, Cherrington, and Hansen[4] consider that leucocytes in excess of 100,000 per cc. of milk indicate udder infection. According to Merchant and Packer,[5] and Hucker,[6] milk containing leucocytes in numbers greater than 500,000 per cc. is abnormal. Plastridge[7] grouped cows as positive for streptococcic mastitis when leucocytes exceeded 500,000 or 1,000,000 per cc. of milk, depending upon the species of streptococci identified. Bryan[8] regards the presence of leucocytes in excess of 1,000,000 per cc. of milk plus streptococci as evidence of streptococcic mastitis. The majority of workers agree that leucocytes in numbers greater than 1,000,000 per cc. of milk indicate a degree of abnormality.

A total of 2,640 (21.9%) milk samples from 12,077 cows revealed streptococci accompanied by more than 1,000,000 leucocytes per cc. on initial microscopic and cultural examination. In these observations, a count of 1,000,000 per cc. was considered the upper limit of the leucocyte content of normal milk. Streptococci were found in an additional 2,048 (16.9%) samples which were free of leucocytes or contained leucocytes in numbers less than 1,000,000 per cc. The relation of the leucocyte count to Streptococcus-positive milk samples from 12,077 cows is shown in table 2. It is possible that many of the samples which contained streptococci accompanied by leucocytes in numbers less than 1,000,000 per cc. represented cows in which clinical or subclinical symptoms of mastitis had subsided or had not yet developed. Periodic microscopic and cultural examination of milk from, and observation on, a representative number of these cows did not reveal subsequent evidence of streptococcic mastitis. A transient inhabitation by streptococci in the teat canal of apparently normal udders cannot be disregarded in our observations. The potential danger of such animals in the transmission of streptococci as well as the possibility of activation of the disease cannot be excluded under conditions of improper herd management.

SUMMARY

1) Microscopic and cultural examination of milk samples from 12,077 cows of 731 herds in Illinois revealed the presence of streptococci in 4,688 (38.8%).

2) In 2,640 (21.9%) samples, streptococci were accompanied by leucocytes in excess of 1,000,000 per cubic centimeter.

3) Streptococci were present in 2,048 (16.9%) milk samples with less than 1,000,000 leucocytes per cc.

4) In 316 milk samples regarded as suspicious on the microscopic examination, streptococci were isolated from 66 (20.6%) by culturing on Edwards' agar medium.

5) The strip-cup test detected visibly abnormal secretions from 1,141 cows, and streptococci were found in 836 (73.2%) samples.

6) In 504 cows with indurative changes in the udder, streptococci were present in the milk of 289 (57.1%).

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Swine Tuberculosis.—The incidence of swine tuberculosis is an indicator of the amount of tuberculosis in cattle, people, and chickens in a given community, because swine are susceptible to each of the three common types of *Mycobacterium tuberculosis* responsible for the disease in warm-blooded animals.

Insect pests are kept under control at Roosevelt Raceway, New York, America's leading trotting track, by spraying stables, paddocks, grandstand, and grounds with a DDT-kerosene fog.

Studies on Bovine Mastitis
V. The Influence of Prevention and Control Methods on the Incidence of Mastitis Streptococci in Dairy Cattle

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IN A PREVIOUS PAPER, Alberts and Bryan[1] reported the incidence of mastitis streptococci as encountered in 731 dairy herds in a state-wide mastitis control program in Illinois. The objective of the program was to reduce the incidence or to eradicate the microörganisms which cause mastitis, with emphasis on practices to improve udder health. Three fundamental procedures were stressed: namely, herd management, early diagnosis, and treatment.

1) *Herd Management.*—Herd health is essential for efficient milk production. The importance of complete rations, proper housing, avoidance of contagious diseases, and prevention of teat and udder injuries were discussed with the dairymen. Improved milking practices including sanitation of the teats and udder and milkers' hands and disinfection of milking equipment were emphasized. Proper use of the strip cup and the machine in milking was advocated. Preparation of the cow for milking, length of milking time, and stripping of the animal were discussed. Barn sanitation and hygiene measures of proved value were suggested, and disinfection of stanchions, gutters, and barn floors was recommended. Herdsmen were advised not to use teat tubes or dilators. Infected cows were segregated or milked last. The use of adequate bedding, prevention of calves from nursing one another, and drainage and improvement of barnyards were advocated. The practices employed were recommended for all lactating cows in the herd. Application of these recommended measures were the direct responsibility of the dairyman. The practising veterinarian must become familiar with herd management problems as related to the control of infectious mastitis in order to instruct properly his dairy clientèle.

2) *Early Diagnosis.*—The detection of animals with so-called latent infections, which included subclinical cases and cases in which the microörganisms were found without evidence of pathogenic activity, was important in control of infectious mastitis. Early diagnosis has proved valuable as an indicator for segregation and therapy of infected animals. The clinical case of infectious mastitis was easily diagnosed and the type of organism involved often revealed by direct examination. In this study, direct tests, microscopic and cultural, were employed in the examination of milk samples. Indirect tests such as the strip cup, bromthymol blue, Whiteside or its modification, chloride, leucocyte count, Hotis, and palpation of the udder have proved useful.

TABLE I—The Incidence of Streptococci in Milk Samples from 468 Dairy Herds Before and After Introduction of Mastitis Control Measures

No. cows		Str.-positive samples Initial exam.		Str.-positive samples Terminal exam.	
Initial	Terminal	No.	%	No.	%
8,058	8,057	3,288	40.8	1,816	22.5

However, a majority of the indirect tests revealed only the presence of abnormal tissue changes or abnormal glandular secretion after the disease had become established. It was recommended that all cows added to the milking line should be examined thoroughly by the veterinarian, and milk samples from these cows should be negative for mastitis organisms.

3) *Treatment.*—Therapy is a recognized adjunct in reducing clinical symptoms of infectious mastitis. Frequently, the causative microorganisms may be eradicated from the udder following treatment. However, it must be recognized that therapy alone will not control infectious mastitis. Recurrence of the disease in treated animals is not uncommon, particularly under conditions of improper herd management. The dairyman was advised that therapy does not stimulate resistance against subsequent attacks of infectious mastitis. Various chemotherapeutic agents have been proposed for treating infectious mastitis, and it is impossible to recommend any one as superior. Condition of the udder, dosage of the drug, type of infectious microörganism, and the proper time for administration of the therapeutic

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[1]Alberts, J. O., and Bryan, H. S.: Studies on Bovine Mastitis. IV. The Incidence of Streptococci in Milk Samples from 12,077 Dairy Cows. J.A.V.M.A., *111*, (1947):

agent are some factors which affect the results. Mastitis should be treated by a qualified veterinarian or under his direct supervision.

A mastitis control program in 468 dairy herds located in seven milk-producing areas of Illinois afforded an opportunity to note the initial incidence of streptococci in the cows of these herds and to observe the influence of control measures on the subsequent incidence of streptococci. The widespread occurrence of udder streptococci favors using members of this group rather than staphylococci or other bacteria for a comparative study. Field methods employed in examination of cows under observation and laboratory methods applied in examination of milk samples have been described elsewhere.[1]

TABLE 2—Streptococci in Milk Samples in Relation to Number of Leucocytes in 468 Herds Before and After Application of Mastitis Control Measures

	No. cows	Streptococcus-positive cows		Streptococcus-positive cows: Leucocytes in excess of 10^6/cc.		Streptococcus-positive cows: Leucocytes less than 10^6/cc.	
		No.	%	No.	%	No.	%
Initial Exam.	8,058	3,288	40.8	1,904	23.6	1,384	17.2
Terminal Exam.	8,057	1,816	22.5	894	11.1	922	11.4

RESULTS

In 468 dairy herds enrolled in the statewide coöperative mastitis control program for a period of nine to twenty-four months, the initial examination of milk samples from 8,058 cows revealed streptococci in 3,288 or 40.8 per cent. On terminal examination, *i.e.*, the last examination conducted before termination of the official program on June 30, 1946, streptococci were detected in 1,816 or 22.5 per cent of the samples from 8,057 cows (table 1). The animals comprising those in the terminal examination were not necessarily the same cows as examined originally. Milk samples from the lactating cows of each herd were tested periodically; however, some animals had died or had been sold during the interval and replacements had been added to the herds. A decrease of 44.8 per cent in the incidence of streptococci, after introducing preventive and control measures in 468 dairy herds, seems significant.

Coincident with the reduction of Streptococcus-positive cows, there was also a reduction in the ones whose milk contained more than 1,000,000 leucocytes per cc. In these observations, a count of 1,000,000 per cc. was considered the upper limit of the leucocyte content of normal milk. The initial examination revealed streptococci in 1,384 (17.2%) of the samples containing less than 1,000,000 leucocytes per cc., while in 1,934 (23.6%) of the samples, streptococci were accompanied by leucocytes in excess of 1,000,000 per cc. On terminal examinations, 922 (11.4%) of the samples contained streptococci and leucocytes in numbers less than 1,000,000 per cc., and in only 894 (11.1%) of the cows were streptococci present and accompanied by leucocytes in excess of 1,000,000 per cc. (table 2). The incidence of streptococci accompanied by less than 1,000,000 leucocytes per cc. of milk was reduced 33.3 per cent, and the incidence of streptococci accompanied by more than 1,000,000 leucocytes per cc. was reduced 53.1 per cent.

Since critical field studies on the effect of individual preventive and control measures, such as sanitation of milking equipment, preparation of the cow for milking, etc., were not conducted, any attempt to evaluate the influence of a single factor is difficult. Segregation or disposal of cows with chronic infectious mastitis has proved helpful.

In 150 herds observed, a total of 601 (18.1%) of 3,314 cows were removed from the herds because of infectious mastitis (table 3). It was noted that during the first six months of the control program, cooperating dairymen removed the majority of the chronic infected cows from their herds. In this period, dairymen who had been enrolled in the program for one year removed 139 (14.8%) of 933 cows and disposed of only 36 (4.0%) cows in the following six months. Dairymen enrolled in the program for two years disposed of 260 (10.9%) of 2,381 cows during the first six months and 166 (7.0%) in the following

eighteen months. It seems reasonable to assume that many of these animals might have been retained in the herds one or more years before mastitis would have caused serious losses in milk production. The desire to reduce the hazard of transmission stimulated dairymen to cull infected cows.

Experimental treatment of 258 cows which had shown clinical symptoms of streptococcic mastitis revealed 150 (57.4%) negative to streptococci on subsequent tests conducted two to six months following udder infusions with various chemotherapeutic agents. On the other hand, it should be recognized that the treated cows were maintained in herds where mastitis prevention and control measures were employed and the possibility of reinfection was materially reduced.

In addition to segregation and culling of infected cows, other factors may be regarded influential in reducing streptococci in the herds. Coöperating dairymen reported that improved herd and equipment sanitation and a better understanding of udder structure and function were associated with improved milking practices. Undoubtedly, these essentials in dairy cattle management played an important rôle in the improvement of udder health and reducing the transmission of streptococci to healthy cows.

Results in different herds were proportionate to the control measures applied and to the effort made by the dairyman. Not all coöperating dairymen obtained herd improvement and, in a majority of those cases, the field veterinarians reported that the dairymen had employed "short cuts" in certain of the recommended measures which nullified progress.

A total of 54 herds which revealed streptococci in milk from the cows on initial tests became free of udder streptococci on one or more subsequent tests after herd mastitis control measures had been introduced. However, occasional flareups of clinical mastitis were not eliminated in a majority of these herds.

In connection with the state-wide mastitis control program, Illinois veterinarians have further stimulated their dairy clientèle to initiate the program of prevention and control. More than 100 practising veterinarians are submitting herd milk samples to the laboratory for bacteriologic examination. In addition, many conduct an independent diagnostic service by examining milk samples in general practice and use the university laboratory to check suspicious samples only. It is estimated that the services of 300 practitioners will be required to expand the program throughout Illinois. The coöperation of dairymen, the veterinarians, the laboratory, and all other agencies interested in the production and processing of milk is necessary for the successful suppression of losses from bovine infectious mastitis.

TABLE 3—Cows Culled with Infectious Mastitis in 150 Dairy Herds

			One-yr. coöperators			Two-yr. coöperators		
No. cows	Infected cows culled	%	No. cows	Cows culled	%	No. cows	Cows culled	%
3,314	601	18.1	933	175	18.8	2,381	426	17.9

SUMMARY

In connection with a state-wide bovine mastitis control program, data show the influence of preventive and control measures on the incidence of mastitis streptococci in 468 herds under observation over a period of nine to twenty-four months.

1) On initial microscopic and cultural examination of milk samples from 8,058 cows, streptococci were found in 3,288 (40.8%), while on terminal examinations, following application of control measures, streptococci were found in milk samples from 1,816 (22.5%) of 8,057 cows.

2) Streptococci accompanied by leucocytes in excess of 1,000,000 per cc. were found in 1,904 (23.6%) of 8,058 milk samples on initial examinations, and only 894 (11.1%) of 8,057 samples contained streptococci accompanied by leucocytes in excess of 1,000,000 per cc. on terminal examinations.

3) In 150 herds including 3,314 cows, coöperating dairymen disposed of 601 (18.1%) infected cows to aid in the control of infectious mastitis.

4) Examination of milk samples two to six months following experimental udder therapy of 258 Streptococcus-infected cows revealed 150 (57.4%) had become negative to streptococci.

5) Following the introduction of mastitis

control measures, 54 (11.5%) of 468 herds which contained infected cows on the initial examination of milk samples became free of udder streptococci on one or more subsequent examinations.

Tuberculosis Is Not Eradicated

Hoard's Dairyman (May 10, 1947) offers a well-pointed reminder that bovine tuberculosis is still with us and that indifference to regular testing is the seed that may reinfect all of America's herds. State and federal veterinarians are charged with protecting the nation from this disease, but there is little they can do if dairymen and livestock breeders do not coöperate with them.

"We spend a great deal of time complimenting ourselves on having conquered bovine tuberculosis," this publication observes — implying that less back-patting and more testing of cattle throughout the country would insure that tuberculosis does not get out of hand.

Chemotherapy of Tuberculosis. — The search for an antituberculous chemotherapeutic agent goes on. One of the newer agents of this category is diploicin, a halogenated diphenyl ether similar to thyroxine which, according to Barry of the University College of Dublin, inhibits the growth of *Mycobacterium tuberculosis* in a dilution of 1 to 100,000.—*From Biological Abstracts, Sec. E, February, 1947.*

Complement Fixation Test for Parasitism.—A method of making a diagnosis of parasitic disease through the use of the complement fixation test was reported in *Public Health Reports* (Apr. 12, 1946) by Bozicevich, Hoyem, and Walston. Full directions for making and interpreting the test were given.

The science of endocrinology originated in 1855 through clinical studies of suprarenal hypofunction by the English physician, Thomas Addison (1793-1860), on bronze skin which was renamed Addison's disease for him. It was also clinical medicine that connected thyroid hyperfunction to toxic, or exophthalmic, goiter once known as Grave's disease.

Penicillin in Beeswax.—The latest treatment for early syphilis, consisting of calcium penicillin in beeswax administered intramuscularly in two doses of 300,000 units eight hours apart or 600,000 units at one dose, is reported to give responses that suggest similar treatment for spirochetoses in animals.

Human Warbles.—One out of a total of 4 human cases of *Hypoderma bovis* infection reported in the literature is described. The patient was a boy 14 years old. The swellings were 1 to 5 cm. in diameter and raised from 0.5 to 1.0 cm. above the level of the skin of the trunk, limbs, and head, causing a creeping sensation and pricking pain when touched. Some disappeared and others turned from red to black and discharged the maggot. The phenomenon lasted two months and occasioned fever and toxic symptoms.—*British Medical Journal quoted by Excerpta Medica, April, 1947.*

Newcastle disease (avian pneumoencephalitis) research was temporarily sidetracked, says the *Poultry Tribune,* when attention of top USDA experts was diverted to the outbreak of foot-and-mouth disease in Mexico. Dr. Maurice S. Shahan who was in charge of the laboratory for Newcastle disease research was assigned to the Mexican project.

Radio-Type Stethoscope.—U. S. Patent 2,419,471 has been issued to a Michigan inventor on a physician's stethoscope with a built-in amplifier. The parts for this radio-like instrument, including microphone, tubes, and batteries, fit into a container the size of a pocket flashlight.

Rabies in the Fox

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Morgantown, West Virginia

AS THE literature concerning rabies in wild animals is quite limited, this report may be of general interest. During the past few months I examined a number of fox brains for Negri bodies, in connection with an outbreak of rabies in foxes in northern West Virginia.

In each case, the person who brought the head or carcass to the laboratory was questioned concerning the behavior of the animal previous to being killed. The foxes were observed briefly in all cases; the period covered by these observations varied from a few minutes to a few hours.

Case 18,862, a gray fox, appeared at a farm home at dusk and attacked a Collie on the porch. The commotion attracted the attention of the farmer's wife who opened the door and admitted the dog into the house. The fox attempted to follow, but was stopped by the slamming of the door. The fox was lost in the darkness, but the following morning when the farmer and the dog were going to the barn, the fox or another one attacked the dog. The fox was shot and the examination of the brain was positive for Negri bodies.

Case 18,961, a gray fox, appeared at a farm home and attacked a dog on the porch. When the door was opened, the fox followed the dog into the house and was killed by a blow from the butt of a gun. The examination of its brain was positive for Negri bodies.

Case 19,018, a gray fox, crossed a farmer's path through a wooded lot without apparent consciousness that the two paths intersected. The farmer caught the fox by the tail and killed it with a cudgel. The brain examination was negative for Negri bodies. Either this fox was negative for rabies or it was killed too early for Negri bodies to form.

Case 19,021, a gray fox, repeatedly approached two men clearing brush. The men drove the fox away several times. The last time the fox approached, it attacked a dog that was with the men. The dog killed the fox. The examination of the brain was negative for Negri bodies. Evidently, this fox also was negative for rabies or it was killed too early for Negri bodies to form.

Case 19,035, a gray fox, exhibited too much bravery in the presence of human beings. The fox was shot. The examination of the brain was negative for Negri bodies, because either it was negative for rabies or it was killed too soon.

Case 19,090, a red fox, chased a farmer's dog over the farm. The fox was shot. The examination of the brain was positive for Negri bodies.

Case 19,190, a gray fox, apparently appeared from nowhere and suddenly attacked 1 of 3 boys playing along a creek. The fox caught the boy by the calf of the leg and refused to release its hold. The oldest of the 3 boys, who was about 11 years old, seeing the dilemma of his younger brother, choked the fox to death with his bare hands. The examination of the brain was positive for Negri bodies.

Case 19,208, a gray fox, attacked a dog in the yard of a home located in a small town. The owner's investigation of the fox and dog fight resulted in the dog retreating and the fox attacking the man. The fox was finished off by the appearance of a large dog and the use of a club. The examination of the brain was positive for Negri bodies.

Case 19,242, a gray fox, was killed by 2 dogs in the midst of a group of farm buildings. The examination of the brain was positive for Negri bodies.

Case 19,245, a red fox, apparently appeared from nowhere and attacked a small girl who was with her father. The fox caught the girl just above the ankle, refused to release its hold and was promptly killed by the girl's father. The examination of the brain was positive for Negri bodies.

Case 19,289, a gray fox, was killed on the front porch of a farm home by 2 dogs. The examination of the brain was positive for Negri bodies.

Case 19,323, a red fox, had become vicious and was known to have bitten 6 dogs. The examination of the brain was positive for Negri bodies.

Case 19,338, a gray fox, bit some geese and a dog. The fox was killed by the owner of the dog. The examination of the brain was positive for Negri bodies.

Case 19,374, a red fox, came to a farm home and was killed by the dog. The farmer reported that the fox was just too brave to be normal. The examination of the brain was negative for Negri bodies.

In my experience with rabies in domestic and wild animals, the one outstanding and constant symptom has been a change

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in behavior or disposition. In the cases reported herein, this feature was outstanding. The normal fox is a retiring animal in the presence of human beings and dogs; his instinct is to escape.

In these rabies cases, the foxes were fearless and aggressive and showed a tendency to attack. For dogs to chase the fox is normal, but for the fox to chase and attack dogs and human beings is certainly a change in behavior and disposition.

The information regarding symptoms, obtained from the persons presenting the heads, is meager but shows evidence that any fox that exhibits a change markedly different from the normal behavior should be considered a rabies suspect, especially in those sections of the country where rabies is more or less enzoötic.

Rabies and the Vampire Bat

A danger to American livestock, apart from foot-and-mouth disease, lurks below the Mexican border. It's the paralytic rabies contracted by animals from the bite of the insectivorous bats that swarm in large colonies from caves of northern Mexico within 250 miles of the Rio Grande. Speleologists incriminate bats also for spreading scrub typhus, yellow fever, and Chagas' disease (trypanosomiasis) of man and horses. Inasmuch as large colonies of bats inhabit caves in southwestern United States and spread rabies among themselves, it seems to be but a question of time until the menace is added to the veterinary problems of this country.

Sodium Fluoride in Swine Ascariasis

A trial to test the efficacy of sodium fluoride in expelling *Ascaris suis* from pigs lightly infected with this parasite is reported by Morgan and Grummer *(Veterinary Science News,* University of Wisconsin, April 15, 1947).

The experiment was conducted on 30 pigs which had been sent to market. They were divided into three groups of 10 pigs each. The pigs in group 1 were housed and fed individually; group 2 was fed and housed in a group; and the pigs in group 3 served as controls. Each lot was fed the same feed mixture, except that 1 per cent of sodium fluoride was added to that portion fed to lots 1 and 2. Unconsumed feed was removed at the end of twenty-four hours. The efficacy of treatment on expelling ascarids was 89.9 and 100 per cent, respectively, in the two groups. Thorn-headed worms *(Macracanthorhynchus hirudinaceus)* were not removed by the treatment.

No symptoms of lesions were observed, and there was no significant difference in the amount of fluorine in the tissues of control and treated animals.

"Sodium Fluoride for Removing Large Roundworms from Swine" is the title of circular 149-A of the Colorado A. & M. College by Dr. A. A. Goodman, extension veterinarian.

Adrenal Cortical Extract in Ketosis

Shaw, of the Storrs (Conn.) experiment station, attributes a specific effect to adrenal cortical extract in the treatment of ketosis, though he points out that adrenal insufficiency is not necessarily indicated. Four cows injected with this extract responded immediately with improved appetite and a return of the blood glucose and acetone bodies toward normal values.—*J. Dairy Sci., May, 1947.*

Virus Pneumonia. — Is pneumonia of horses and probably of other animals a "virus pneumonia," comparable etiologically to that type of pneumonia now occupying attention in human medicine? Dieckernoff, Nocard, McKillip, and others of 'way back when, insisted that pneumonia in animals did not correspond to the typical lobar pneumonia of man, but was caused by influenza virus plus secondary bacterial infection. The curious of 1947 await a contradiction.

Veterinary Pharmacology. — Although much of the knowledge of pharmacodynamics is derived from testing drugs on animals, articles on veterinary pharmocology are about as rare as the legendary dodo. Except for a few tests on exogenous disinfection, and clinical reports based on the teachings of human medicine, veterinary medicine is not famous for original work on the action of drugs.

Because colchicine interferes with mitosis, it has been suggested for use in the treatment of tumors.

Gleanings from Committee Reports

(The committee reports will be presented at the 84th Annual Meeting in Cincinnati, Aug. 18-21, 1947.)

Public Relations.—Veterinarians must give better, or a more complete, service and cooperate further in developing a well-organized veterinary public relations program to more fully acquaint the public with the economic and public health importance of veterinary medicine.

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Nutrition.—A condition extensively observed in brood sows this spring is the cessation of milk flow ten days to three weeks after farrowing, which results in the death of the litters from starvation.

• • •

Veterinary Service.—The Committee suggests to the secretaries of the state veterinary examining boards of the several states that they fix a future date, beyond which no veterinarian could practise independently in that state until he had at least one year of experience as an intern.

• • •

National Board of Veterinary Examiners.—It is hoped that a detailed plan of operation for such a board will be ready and published sufficiently early in the year so that our entire membership will have ample time to study it before the next annual meeting.

• • •

Registry of Veterinary Pathology.—The increasing number of practitioners calling upon the Registry to provide professional services indicates a growing appreciation of the importance of pathology to an intelligent understanding of disease processes.

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Diseases of Wild and Furbearing Animals.—It is the responsibility of the veterinary profession to be ready to give just and well-founded recommendations for dealing with wildlife, should foot-and-mouth disease spread to this country.

• • •

Nomenclature of Diseases.—The matter of a systematic and comprehensive plan for the classifying and listing of the diseases of animals continued to occupy the attention of the Committee this past year.

• • •

Parasitology.—It is the opinion of the Committee that an annual review of the chemotherapy of parasitic diseases be undertaken. Not only should anthelmintics be reported upon, but the study should include insecticides, acaricides, coccidiostatic agents, etc., as far as is possible.

• • •

Diseases of Food Producing Animals.—Some system of reporting and tabulating the prevalence of animal diseases is badly needed to replace the speculative epizoötiology now prevailing.

Enforcement of Code of Ethics.—The average veterinarian does not wish to be a chronic violator of the Code of Ethics, but much violation is due to ignorance of the Code on the one hand and the feeling that nothing will be said or done by the profession on the other hand.

• • •

Motion Picture Library.—The Committee has purchased copies of four completed silent films, due to the prohibitive cost of establishing sound tracks on existing films.

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History.—The Committee's main purpose is first to cultivate a desire for knowledge of the past for future guidance.

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Legislation.—The two major items of national legislation during the past year were the foot-and-mouth disease legislation and the Officer Personnel Act of 1947.

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Biological Products.—It is believed that the scope of the Division of Virus-Serum Control of the United States Bureau of Animal Industry should be extended beyond mere control efforts. It should include research on the development of new products.

• • •

Therapeutic Agents and Appliances.—It has been decided that the Committee should function much like the Council of Pharmacy and Chemistry of the American Medical Association.

• • •

Joint Committee on Foods.—In the judgment of the Committee, it would be highly undesirable for a competitive situation to develop whereby there would be, concurrently, a group of dog foods bearing government certification, and a group of foods bearing the Seal of Approval of the Joint Committee.

New Tapeworm Remedy for Sheep

Arsenate of lead in 1-Gm. doses is recommended as *the* remedy for tapeworm infection of sheep by Dr. R. T. Haberman, BAI veterinarian of South Dakota. Reports to the effect that heavily affected flocks respond promptly to the treatment have been widely published in sheep breeders' magazines.

Although human brucellosis is always with us, more cases show up in June, July, and August (probably due to contact with animals during the farrowing and calving season) than in any other three-month period.—*C. F. Jordan, M.D.*

Sodium Sulfamerazine in the Treatment of Pullorum Disease

G. W. ANDERSON, B.S., D.V.M., M.S., J. C. JONES, J. B. COOPER, M.S., and C. L. MORGAN, M.S.

Clemson, South Carolina

PULLORUM disease is one of the most costly poultry diseases. It destroys the baby chick, lowers the productivity of the hen, and when once established in a flock is difficult to eradicate. Two recently developed sulfonamides, sulfamerazine and sulfadiazine, appear to be beneficial in the treatment of this disease. Severens, Roberts, and Card[1] reported that 0.5 per cent sulfamerazine or 2.0 per cent sulfadiazine protected a high percentage of chicks when they were exposed to artificial inoculations with 24-hour broth cultures of *Salmonella pullorum*. Mullen[2] found that 0.5 per cent sulfamerazine in the feed reduced the mortality in turkey poults naturally infected with *S. pullorum*. Anderson[3] found that 0.5 per cent sulfamerazine in the feed considerably reduced the mortality in chicks that were naturally infected as day-old chicks but did not receive treatment until they were 14 days old and had suffered 21.6 per cent mortality. Mattis *et al.*[4] studied the possibility of toxicity as a result of administering sulfamerazine to 32- to 46-day-old chickens. They found no significant pathologic change in 12 different tissues of the body after feeding 0.5 per cent or 1.0 per cent of the drug for a period of fourteen days. This treatment appeared not to retard significantly the growth rate of the chickens. These results prompted the study discussed below with sodium sulfamerazine* as the chemotherapeutic agent used in the treatment of artificially induced *S. pullorum* infection. Sodium sulfamerazine is a water-soluble form of sulfamerazine and its administration in the drinking water is simpler than the administration of sulfamerazine in the feed.

MATERIALS AND METHODS

The 235, day-old Rhode Island Red chicks, hatched from pullorum-clean hens, were divided into five groups of 47 chicks each. Groups 1, 2, 3, and 4 immediately were inoculated *per os* with 24-hour broth cultures of *S. pullorum*. Group 5 was the noninfected, nontreated controls. The chicks were confined in 50-chick-capacity brooders with wire bottoms. Each pen was well isolated from all of the others. When the chicks were 6 weeks old, they were transferred to larger isolated brooders. The chicks were weighed at 12 and 24 days of age to determine any weight variation that might have occurred during the period of administration of sodium sulfamerazine. Table 1 indicates the treatment administered to the various groups.

Group 1.	Control. Received no treatment after inoculation with *S. pullorum*.
Group 2.	Treated with 0.2 per cent sodium sulfamerazine solution as drinking water for 21 days, immediately after inoculation with *S. pullorum*.
Group 3.	Treatment same as group 2, started 36 hours after inoculation with *S. pullorum*.
Group 4.	Treatment same as group 2, started 72 hours after inoculation with *S. pullorum*.
Group 5.	Noninfected, nontreated control.

No losses or reactions due to pullorum disease were sustained in group 5, which was disposed of when the birds were 9 weeks old. Blood examinations to determine the concentration of free and conjugated sulfamerazine were made at 48-hour intervals according to the method of Bratton and Marshall.[5] In order to have a sufficient quantity of blood for the sulfamerazine determinations, 39 chicks were killed from the first through the eighteenth day. After the eighteenth day, sufficient blood for sulfonamide determinations could be drawn from the wing veins. All chicks destroyed were examined bacteriologically. All dead birds were autopsied and examined bacteriologically.

Birds surviving at 9 weeks of age were pullorum-tested by the rapid whole-blood method as shown in table 2.

DISCUSSION

The data presented above indicate that sodium sulfamerazine in a concentration of 0.2 per cent dissolved in the drinking water will control artificially induced pullorum disease. In contrast to a mortality of 51 per cent in the infected control pen (group

Technical contribution No. 144, South Carolina Agricultural Experiment Station, Clemson, S. Car.

Associate animal pathologist (Anderson), laboratory assistant (Jones), associate poultryman (Cooper), poultryman (Morgan).

*Provided by Sharp & Dohme, Glenolden, Pa.

1), the three groups, 2, 3, and 4, to which sodium sulfamerazine was administered, had a mortality due to pullorum disease of 4.2, 2.1, and 2.1 per cent, respectively. These losses occurred after the cessation of treatment. Since there was no difference in mortality between groups 3 and 4, it appears that sodium sulfamerazine would be effective if administered at any time during the first three days of an outbreak of pullorum disease.

There was no significant difference in weight between the noninfected, nontreated controls (group 5) and the treated birds, indicating that 0.2 per cent sodium sulfamerazine solution as drinking water had neither an appetite-promoting nor a weight-retarding effect. The infected, nontreated controls (group 1) weighed less than the other groups due to the number of sick birds present in it. There was no evidence of toxicity due to sodium sulfamerazine. Kidneys, livers, and spleens of treated birds were found normal at the postmortem examinations.

The average blood concentrations (mg. per 100 cc.) of free sulfamerazine in groups 2, 3, and 4 were 16.24 (88.5%), 17.15 (89.0%), and 15.88 (87.7%), respectively, and of conjugated sulfamerazine 1.88 (11.5%), 1.89 (11.0%), and 1.96 (12.3%), respectively. The large amount of free sulfamerazine in the blood compared with the small amount of the conjugated form indicates that sodium sulfamerazine should be an effective compound. Blood determinations (mg. per 100 cc.) twenty-four hours after treatment was stopped showed a decided drop in the free sulfamerazine, but only a slight decrease occurred in the quantity of conjugated sulfamerazine.

The data in table 3 indicate that free sulfamerazine is rapidly eliminated from the body as soon as treatment ceases.

The most interesting result obtained in this study was the high percentage of reactors that occurred in the three groups receiving treatment when these birds were tested at 9 weeks of age by the rapid whole blood method. Group 1, the infected control group, had 73.9 per cent reactors while groups 2, 3, and 4 had 63.3, 74.2, and 65.6 per cent, respectively. This indicates that sodium sulfamerazine in the concentration used, although undoubtedly protecting the chicks against pullorum disease, apparently did not prevent the formation of circulating antibodies against *S. pullorum*. The type of inoculation in this experiment would, however, rarely be met with in a natural outbreak of pullorum disease and, consequently, the results of

TABLE I—The Effect of Administering a 0.2 Per Cent Solution of Sodium Sulfamerazine as Drinking Water to Chicks Inoculated per Os with Salmonella Pullorum

	Results through 76 days								
Group	Wt. of Survivors 12-da. old	24-da. old	Chicks started (No.)	Mortality Deaths (No.)	Deaths (%)	S. pullorum isolated	Av. blood conc. sulfamerazine (mg./100 cc.) (free)	(conj.)	Treatment for 21 days
1	70 Gm.	150 Gm.	47	24	51.0	24	.....	.....	Infected, nontreated controls.
2[1]	86 Gm.	175 Gm.	47	2	4.2	2[a]	16.24 (88.5%)	1.88 (11.5%)	Treated immediately after inoculation.
3[2]	87 Gm.	160 Gm.	47	1	2.1	1[b]	17.15 (89.0%)	1.89 (11.0%)	Treated 36 hours after inoculation.
4[3]	93 Gm.	170 Gm.	47	1	2.1	1[c]	15.88 (87.7%)	1.96 (12.3%)	Treated 72 hours after inoculation.
5	84 Gm.	161 Gm.	47	0	0	0	.....	.....	Noninfected, nontreated controls.

[1]13 chicks destroyed for sulfamerazine blood determination. *S. pullorum* could not be isolated.
[2]13 chicks destroyed for sulfamerazine blood determination. *S. pullorum* could not be isolated.
[3]13 chicks destroyed for sulfamerazine blood determination. *S. pullorum* could not be isolated.
[a]These chicks died 14 and 55 days after the cessation of treatment. No losses due to pullorum occurred during treatment.
[b]This chick died 53 days after the cessation of treatment. No losses due to pullorum occurred during treatment.
[c]This chick died 1 day after the cessation of treatment. No losses due to pullorum occurred during treatment.

this blood test may not be applicable in a natural outbreak.

CONCLUSIONS

1) Sodium sulfamerazine, administered in the drinking water in a concentration of 0.2 per cent beginning at one, thirty-six, and seventy-two hours after exposure and continuing for twenty-one days for all groups protected chicks artificially inoculated *per os* with *Salmonella pullorum*.

TABLE 2—Number of Reactors Among Survivors in All Groups to Rapid Whole-Blood Pullorum Tests at 9 Weeks of Age

Group	Chickens tested (No.)	Reactors (No.)	Reactors (%)
1[1]	23	17	73.9
2[2]	30	19	63.3
3[3]	34	26	74.2
4[4]	32	21	65.6
5[5]	45	0	0

[1] chick in group 2, and 1 chick in group 3 died of pullorum 13 and 11 days after the blood test.
[2] 24 chicks died of pullorum disease.
[3] 13 chicks used for sulfamerazine determination. 1 died of pullorum, 3 died of other causes.
[4] 13 chicks used for sulfamerazine determination.
[4] 13 chicks used for sulfamerazine determination. 1 died of pullorum, 1 died of other causes.
[5] 2 chicks died of unknown causes.

2) The treatment did not affect the appetite or weight gain in the treated birds. The average weight of the survivors in group 1 (the infected, nontreated controls) was less than in the other groups, apparently because of the number of sick birds present.

TABLE 3—Free and Conjugated Sulfamerazine Present in the Blood 24 Hours after the Cessation of Treatment

Group	Average blood concentration sulfamerazine (mg. per 100 cc.) (free)	(conjugated)
2	1.90	1.65
3	1.55	1.45
4	1.90	1.50

3) No toxic effects were seen in any of the treated chicks during or after the period of administration of sodium sulfamerazine.

4) The average blood concentrations (mg. per 100 cc.) of free and conjugated sulfamerazine were as follows: group 2, 16.24 (88.5%) and 1.88 (11.5%); group 3, 17.15 (89.0%) and 1.89 (11.0%); group 4, 15.88 (87.7%) and 1.96 (12.3%). The low percentage concentration of the conjugated form indicates that most of the sulfamerazine was free and thus available to combat infection. The blood concentration of free sulfamerazine dropped rapidly as soon as treatment was discontinued.

5) The high percentage of reactors occurring in the nontreated and treated inoculated groups indicated that sodium sulfamerazine, 0.2 per cent, protected the chicks against the disease but did not completely destroy the blood agglutination reaction to *S. pullorum*. These results, however, may not be applicable in a natural outbreak of pullorum disease.

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Re Bang's, Newcastle, Johne's, et al.

One wonders about the wisdom of identifying a disease by a person's name when a term that is descriptive or that is based on an etiologic origin is so much more appropriate.—*From the Proceedings of the Mayo Clinic, 22, (Apr. 30, 1947): 1-2.*

Readers of the JOURNAL ought to realize by now that the use of *brucellosis, pneumoencephalitis, pseudotuberculous enteritis,* and other descriptive terms is not a whim of the editorial staff but stems from a quiet desire on the part of editors to keep veterinary literature from sailing on at a subnormal level.

The old veterinarians (most of them) would rather have taken Patrick Henry's second choice than put an advertisement in the telephone directory, or a newspaper.

Wisconsin, with 170,000 dairy farmers, produces 12 per cent of America's milk supply.—*J. Milk Technol.*

NUTRITION

The Use of Sulfur in Reducing Death Losses from Enterotoxemia in Feeder Lambs

JOHN F. CHRISTENSEN, D.V.M., Ph.D., A. W. DEEM, D.V.M., A. LAMAR ESPLIN, B.S., M.S., and FLOYD CROSS, D.V.M.

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ENTEROTOXEMIA, commonly called overeating disease, is responsible for greater mortality in lambs being fattened in the feedlots of Colorado than all other causes combined. In this area, the annual death loss from enterotoxemia is approximately 2 per cent in well-managed feedlots, while instances of mortality reaching 5 per cent or more are not unusual.

Studies on the etiology and control of this disease carried out by the Pathology Section, Colorado Experiment Station, for many years[1] have shown that reduction of concentrates in the ration is relatively effective in temporarily stopping death loss in actual outbreaks. Frequently, the losses are considerable before the operator is willing to adopt this program. Consequently, the need for an effective, inexpensive, and practical means of controlling the disease through prevention can hardly be overestimated.

During investigations on the control of coccidiosis conducted in Nebraska in 1941-1942, it was noted by Christensen[2] that sulfur, when incorporated in the ration for a 72-day feeding period, not only was highly efficient in preventing coccidiosis but also greatly lowered the total mortality from all causes. Although it was not determined in this experiment, it seemed reasonable to assume that the decrease in mortality might be due to the action of sulfur in controlling enterotoxemia, which normally is the major cause of death in feeder lambs. To test this possibility, experiments to determine the prophylactic efficiency of sulfur against enterotoxemia were conducted during the past three feeding seasons, the results of which are reported in this paper.

PROCEDURE

The tests during the feeding seasons of 1943-1944 and 1944-1945 were conducted on farms in the vicinity of Fort Collins, Colo., while the 1945-1946 experiment was conducted on the college farm by the Pathology and Animal Investigations Sections, Colorado Agricultural Experiment Station. While the rations used in each experiment varied somewhat, the sulfur-fed and control lambs in any single experiment were fed and managed as nearly alike as possible. In general, the feeds consisted of alfalfa hay as the main roughage, kept before the lambs continuously, with corn and barley the chief concentrates. Supplemental feeds such as sugar-beet pulp, linseed meal, and bran were used in some instances. In each experiment, the feeder lambs were separated at random into sulfur-fed and control groups, thus guaranteeing nearly identical susceptibility to enterotoxemia in the various experimental groups. The only obvious difference in the management of the sulfur-fed and control groups of lambs in any experiment was that one group received sulfur in the daily ration.

A single experiment was conducted in 1943-1944 on a farm in the vicinity of Fort Collins

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A summary of some of the data presented here appeared in an article by Esplin, Deem, and Connell, entitled "Feeding Sulphur to Lambs Cuts Gains but Prevents 'Overeating' Death Losses," in the *Colorado A. and M. News* for September, 1946. However, full credit for the idea of using sulfur for the prevention of toxemia in feeder lambs, and the execution of experiments demonstrating the effectiveness of the chemical, belongs to the authors of the paper presented here.

(farm A). Twelve hundred feeder lambs of a single shipment from southern Colorado were divided at random into two groups and placed in adjacent feedlots on Oct. 21, 1943. The two groups of lambs were managed, fed, and watered identically, with the exception that one group was fed sulfur incorporated in bran beginning on the twelfth day of feedlot confinement and continuously thereafter for approximately five months, when the experiment was terminated after removal of about half the lambs from each pen for marketing. The amount of sulfur fed was increased gradually from approximately 3.5 Gm. per lamb per day at the beginning to 7.5 Gm. per lamb per day over the first two months of feeding, and remained at the maximum figure for the remaining three months of the experiment.

TABLE I—Death Losses in Sulfur-Fed Lambs and Control Lambs in Experiments Conducted During the Feeding Seasons of 1943-1944 and 1944-1945

Data	1943-1944 experiment Farm A Sulfur-fed lambs	Farm A Control lambs	1944-1945 experiments Farm B Sulfur-fed lambs	Farm B Control lambs	Farm C Sulfur-fed lambs	Farm C Control lambs
No. of lambs	600	600	570	600	600	600
Deaths from all causes (no.)	7	19	2	13	12	26
Mortality from all causes (%)	1.17	3.17	0.35	2.17	2.00	4.33
Deaths from enterotoxemia only (no.)	6	9	2	13	5	20
Mortality from enterotoxemia only (%)	1.00	1.50	0.35	2.17	0.83	3.33
Deaths not diagnosed (no.)	1*	8*	0	0	1	1

*Removed by a by-products company before autopsy could be performed.

During the feeding season of 1944-1945, tests were conducted on two other farms in this vicinity (farms B and C). On farm B, 1,170 lambs of a single shipment from Wyoming were divided into two approximately equal groups and confined in adjacent feedlots on Dec. 4, 1944, and then handled in the same manner as the lambs on farm A. Sulfur was fed, incorporated in ground barley, to one group of 570 lambs, beginning with about 3 Gm. per lamb per day on the first day of confinement to feedlots and increasing gradually to 7.5 Gm. per lamb per day over a period of a month. This maximum dosage was then maintained until March 3, 1945, when the experiment was terminated.

Used on farm C in the 1944-1945 experiments were 1,200 lambs from a single shipment from Wyoming. These animals were divided into two equal groups and penned in adjacent feedlots on Oct. 18, 1944. Sulfur feeding to one lot of these lambs was started on November 10. The chemical was incorporated into linseed meal in gradually increasing amounts, to reach a maximum of 7.5 Gm. per lamb per day in about seven weeks. This maximum amount was then maintained for the remaining three months of the experiment, which terminated on March 26, 1945.

In order to evaluate more critically the effect of sulfur in the control of enterotoxemia, and especially to determine its effect on the feed consumption and on weights and gains, an experiment with 2,000 lambs was conducted on the college farm during the feeding season of 1945-1946. These lambs, purchased from a single source in Wyoming, averaged 70 lb. each, when feeding was started on Nov. 1, 1945. They were divided into four groups of 500 each. The lambs in two groups were hand-fed, the others self-fed. In each set of two, one group was fed sulfur mixed with the grain, while an untreated group served as controls. The sulfur was mixed with the grain in a 2 per cent concentration, which was maintained throughout the feeding period. As a consequence, the amount of sulfur received per lamb ranged from about 6 Gm. to approximately 20 Gm. per day as feed consumption increased. Since this was a disease control study, a severe challenge was imposed on the lambs by heavy grain feeding. The self-fed lambs, having free access to grain at all times, consumed an average of 1.9 lb. per day for the season. The hand-fed lambs, given all they would clean up in two daily feedings, ate approximately 1.23 lb. of grain per day. The grain ration in all cases consisted of a mixture of equal parts of cracked corn and rolled barley, while the only roughage was alfalfa hay, fed separately through panels.

As an additional challenge to the lambs, and to the effectiveness of sulfur in preventing enterotoxemia, the animals of all groups in the 1945-1946 experiment were exposed to a virulent culture of *Clostridium perfringens*, type D, midway in the feeding period. Approximately equal quantities of this culture were introduced into the drinking troughs of each of the four groups of lambs after two months of feeding, during which time the combined losses from enterotoxemia in all groups were insignificant.

The sulfur used was a 325-mesh, commercial, ground sulfur.* In the feeding operations con-

*Stik-Tite Superfine Dusting Sulphur, Cloud Brand, 325 mesh; furnished through the courtesy of the Texas Gulf Sulphur Company, Houston.

ducted during the first two years, the sulfur was mixed thoroughly with a vehicle such as bran, ground barley, or linseed meal. The sulfurized meal or bran was fed by distributing it uniformly over the concentrate ration at each feeding. In the experiment of 1945-1946, conducted on the college farm, the sulfur was mixed with the grain on a percentage basis and placed in the grain troughs or self-feeders. The lambs readily ate the sulfur-grain mixture.

TABLE 2—Death Losses, Grain Consumption, and Daily Gain in Sulfur-Fed and Control Lambs in the Experiment Conducted on the College Farm during the Feeding Season of 1945-1946

Data	Grain self-fed		Grain hand-fed	
	Sulfur 2%	No sulfur	Sulfur 2%	No sulfur
No. lambs..	500	500	500	500
Deaths from all causes (no.)	9	48	5	33
Mortality from all causes (%)	1.8	9.6	1.0	6.6
Deaths from enterotoxemia only (no.)	4	41	5	29
Mortality from enterotoxemia only (%)	0.8	8.2	1.0	5.8
Average daily grain consumption/lamb (lb.).	1.74	2.04	1.19	1.28
Average daily gain/lamb (lb.)	0.35	0.40	0.31	0.33

The only noticeable change in eating habits was a tendency for the lambs to spend a little more time at the grain trough in cleaning up the allotted ration.

The death loss, as listed in tables 1 and 2, is tabulated under the headings of enterotoxemia and all causes combined, the latter including bloat, pneumonia, urinary calculi, and others. The diagnoses were based on history, symptoms, autopsy findings, and uranalysis. An autopsy was performed as soon as possible after death on each animal listed. The most consistent lesions of acute enterotoxemia were ecchymotic and petechial hemorrhages in the subepicardium, subendocardium, thymus gland, and subperitoneum of the intestines, diaphragm, and abdominal wall. Most lambs showed slight to moderate abomasitis and duodenitis. In most acute cases, glycosuria was marked. The possibility of some diagnostic errors is conceded.

EXPERIMENTAL RESULTS

1943-1944 Experiment.—The results of this experiment are shown in table 1 (farm A). While the mortality from all causes during the entire feeding period totaled 3.17 per cent in the control lambs, as compared with only 1.17 per cent in the sulfur-fed lambs, the effect of sulfur on the incidence of enterotoxemia was not accurately determined because 8 lambs in the control group, or nearly half of the number dead, were removed by the rendering company before postmortem examination could be accomplished. In spite of this difficulty, mortality from enterotoxemia still was less in the sulfur-fed lambs than in the controls.

1944-1945 Experiments.—The results of these experiments are shown in table 1 (farms B and C). On farm B, the incidence of enterotoxemia in the control group during the period of the experiment was 2.17 per cent, which was considerably greater than in the sulfur-fed lambs. The mortality in the sulfur-fed lambs over the three-month period was only 0.35 per cent, so unusually low that the owner eventually began feeding sulfur to both groups of lambs; at that point, the experiment had to be terminated. During the later stages of the experiment, the owner was able to feed lambs receiving sulfur 1.65 lb. of grain per lamb per day, while the maximum amount of grain fed to lambs in the control group was 1.2 lb. per lamb per day.

In the farm C experiment, death losses from all causes were considerably lower in the sulfur-fed group than in the control group. Early in the feeding period, considerable contagious ecthyma or "soremouth disease" was noted, and most of the subsequent deaths, other than those due to enterotoxemia, were attributable to secondary complications of this disease. Deaths from enterotoxemia alone totaled 3.33 per cent in the control lambs, as compared with only 0.83 per cent in the sulfur-fed lambs.

1945-1946 Experiment.—As will be noted in table 2, the losses in this experiment were confined almost entirely to the control groups. The mortality from enterotoxemia in the sulfur-fed groups did not exceed 1.0 per cent, as compared with mortalities from the disease of 5.8 and 8.2 per cent in the two groups of lambs not receiving sulfur in their feed.

In spite of the heavy grain ration imposed upon these lambs, death losses in all groups were minimal during the first two months of feeding, the composite mortality at that time being approximately 0.5 per cent. Immediately following the addition of the virulent culture of *Cl. perfringens*, type

D, to the drinking water of the four groups, death losses from enterotoxemia in the control lambs increased sharply, 24 lambs dying of the disease within a week and 59 within a month. The rapidly accelerated death loss from enterotoxemia following the exposure of the lambs to this culture is at least highly suggestive of the rôle of *Cl. perfringens*, type D, in the etiology of this disease, although this phase of the experiment lacked control.

Table 2 shows that feeding sulfur in 2 per cent concentration in the grain lowered somewhat the average daily grain consumption and daily gain in weight per lamb.

DISCUSSION

The data presented in this paper point strongly to the effectiveness of sulfur as a means of reducing the incidence of this important disease in feeder lambs. In every test to date, death losses from enterotoxemia were significantly less in lambs fed sulfur routinely than in lambs similarly fed and managed but receiving no sulfur in their ration. While sulfur in the amounts fed failed to prevent the disease entirely, the reduction of mortality was so great that in no case did death losses from enterotoxemia exceed 1.0 per cent in lambs fed for as long as five months. The losses from the disease in the untreated control lambs in these experiments varied from 1.5 to over 8 per cent.

At present, no information is available concerning the specific action of sulfur in the control of enterotoxemia. There is even some difference of opinion as to the actual cause of enterotoxemia in lambs. Most workers agree that death is due to toxins produced by *Cl. perfringens*, type D, and that a heavy concentrate ration is a necessary predisposing cause. The sharply accelerated death losses from enterotoxemia following the feeding of a virulent culture of this organism in the 1945-1946 experiment reported here tend to confirm this belief. However, this phase of the experiment is open to criticism on the basis of inadequate control, and further tests are planned on the question of etiology.

It will be noted that, in the experiments conducted during the first two years, measured amounts of sulfur were fed, at no time exceeding 7.5 Gm. per lamb per day. The sulfur-fed and control lambs were never weighed separately, so that the effect of the sulfur on weights and gains could not be accurately determined. There was, however, no reason to believe that the sulfur interfered with feed consumption, gains, or finish in the amounts fed in these experiments. On the other hand, in the 1945-1946 experiment, when the sulfur was mixed with the grain in 2 per cent concentration throughout the feeding period, resulting in the daily consumption of 20 Gm. or more of sulfur by each animal when the lambs were on full feed, grain consumption and daily gains were definitely inhibited. Further experiments will be conducted in an effort to find a level of sulfur which will control enterotoxemia effectively without interfering with normal gains.

In our feeding experiments, we saw no evidence that sulfur was toxic when mixed with grain. It has been shown, however, first by field evidence, and later by controlled experiments,[3] that sulfur is toxic when mixed in rather large quantities with protein supplements such as cottonseed, linseed, or soybean meal. In these experiments, the minimum lethal dose for a 100-lb. lamb was 48 Gm. of sulfur with 335 Gm. of protein concentrate. Since this is an abnormally large amount of sulfur, there appears to be a wide margin of safety for normal feeding.

SUMMARY

The results of three experiments, conducted on farms in the vicinity of Fort Collins, Colo., under fairly well-controlled conditions, indicate that commercial, ground sulfur fed in the grain to lambs confined to feedlots for fattening greatly reduced the incidence of enterotoxemia, or over-eating disease. In these experiments, mortality from enterotoxemia in lambs fed up to 7.5 Gm. of sulfur per lamb per day routinely throughout the feeding period did not exceed 1.0 per cent, while losses from the disease in control lambs receiving no sulfur ranged from 1.5 to 3.33 per cent.

The results of an experiment conducted on the college farm under conditions of heavy feeding and exposure to a highly toxic strain of *Clostridium perfringens* suggest a significant prophylactic action of sulfur in controlling enterotoxemia. Two sulfur-fed lots of lambs showed mortality rates of 0.8 and 1.0 per cent, respectively, as compared with death losses of 5.8 and

8.2 per cent in two control lots. The amounts of sulfur fed in this experiment reduced grain consumption and daily gains.

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[1]Newsom, I. E., and Thorp, Frank, Jr.: Lamb Diseases in Colorado Feedlots. Colorado Exper. Sta. Bull., 448, (Aug., 1938): 19-27.

[2]Christensen, John F.: Sulfur Prophylaxis of Coccidiosis of Feeder Lambs. Am. J. Vet. Res., *5*, (1944): 341-345.

[3]Tobiska, J. W., and Jensen, Rue: Livestock Poisoning Caused by Sulfur in Combination with Protein Concentrates. Colorado A. & M. News, *1*, (Sept., 1946).

Poultry Feeding in 1894

Before scientific feeding displaced hit-or-miss nutrition, feeding was so complex that poultrymen, if they followed the experts' advice, had time for little else. Here, for example, is the ration one authority recommended in 1894:

> One of our greatest chick-starting foods is 3 qt. of hominy chop, 1qt. of wheat midds and 1 qt. of fine ground oats. Pour on boiling water and stir the mixture for several minutes. Feed this combination several times daily. Also supply green feed each day, preferably chopped celery, tops and all. Lettuce should also be fed and occasionally a little ground onion. Then feed ground green raw bone several times daily. Table scraps may also be fed if desired.

Another school of thought believed that poultry feed should be cooked and allowed to stand overnight, since cooking was considered the first step in digestion. Even the early manufacturers of commercial mashes felt that cooking was necessary for chick feeds.—*Larry Wherry in Feedstuffs, May 10, 1947.*

Vitamin B_2, or riboflavin ($C_{17}H_{20}N_4O_6$), was named for its yellow color—flavin—and the sugar radical ribose. The use of "lactoflavin," "hepatoflavin," "zymoflavin," etc., has been discontinued, because of chemical uniformity wherever present. It is present in nearly all living tissues.

Experiments with the use of distillery byproducts as livestock feed are so startling that whiskey may become but a byproduct of the distilling industry, the soluble wastes of which are becoming worth more than the whiskey and, needless to add, more useful.

Folic acid is present in green leaves, animal tissues, and yeast.

Creep-Feeding Pays

"It pays to creep feed pigs," says *Hog Breeder,* for the following reasons:

1) Saves feed.
2) More pigs weaned.
3) Bigger pigs weaned.
4) Saves labor.
5) Decreases pig injuries.
6) Less "shock" at weaning.
7) Supplements sows' milk.
8) Sows stay in better condition.
9) Permits earlier weaning.
10) Insures more successful feeding.

Calf Scours Remedy.—Says a correspondent to the *Western Dairy Journal,* "Here is a simple home remedy for calf scours which I used for many years with excellent results": Dissolve two junket [rennet] tablets in a small amount of warm water, pour into a half cup of warm milk, and give it to the calf just before the milk curdles. Three doses, one hour apart, are usually sufficient, though additional doses may be given if necessary.

Cobalt for Calves.—In areas where cobalt deficiency is common, the requirements of calves for this element can be supplied through the milk of cows on cobalt-fortified rations. Consistent supplemental feeding increased the average cobalt content of milk fourfold in tests made by Archibald at the Massachusetts experiment station, reported in the *Journal of Dairy Science* (May, 1947).

Whey.—Whey, once a "throw away" product of cheese making, contains important amounts of water-soluble vitamins of the natural-source type and minerals. It is now regarded as second only to liver as a source of these factors, deprived as it is of protein, fat, and sugar.

Grapefruit Pulp.—Dried grapefruit pulp blackstrap molasses, and alfalfa leaf meal is an excellent supplement for corn in the feeding of hogs.

The dynamics of thiamin on the cardiovascular system is indicated by the "beriberi heart" associated with acute B_1 avitaminosis, and the enlargement of the right-heart in chronic cases.

EDITORIAL

The Baby Pig Predicament

Random reports from many parts of the Middlewest indicate that the spring of 1947 was a particularly disastrous one for the raising of baby pigs. While most hog raisers reported about the usual number of pigs farrowed, the losses during the first three weeks of life were exceedingly high—up to 90 per cent on some good pig-raising farms, and up to 75 per cent on many others.

While there has sometimes been a tendency to attribute all of these losses to baby pig disease, this is a careless diagnosis because it makes no attempt to identify the cause or the nature of the losses. That this tendency is not universal, nor even widespread, is indicated by the number and the variety of explanations which have been advanced and the many communities from which they originate. The complexity of reports makes increasingly evident the need for careful observation upon which to base a definite diagnosis and the need for withholding statements until all of the facts have been gathered and weighed.

At least a dozen theories have been advanced, and each theory has advocates who have observed enough evidence to corroborate it. Such being the case, it would be well for every practitioner to review his experience with baby pig losses in the light of the findings here presented. Regrettably, there is no clear-cut pattern, nor is there any blanket explanation for the extensive losses which have occurred, but each veterinarian owes it to his clients to tell them that every department of veterinary science connected with a state university in the Middlewest, and every agricultural experiment station in the same area, is working on the problem. Neighboring institutions are comparing notes, and all are anxious to find the correct answer. Almost every institution has a personal interest in this problem, over and above that of a normal research problem and beyond its duty to its swine breeders, because pigs being used in its own feeding and disease control and breeding trials also have been decimated during the spring farrowing season. Losses were particularly heavy during the early spring months, with a noticeable—sometimes an abrupt—drop in losses as summer advanced.

What are some of the theories advanced? And upon what evidence? Starting with some conditions that have been definitely recognized and accurately described, they may be enumerated as follows:

1) *Hypoglycemia.*—Losses usually occur during the first three or four days of life. Pigs that survive this period seldom die. The condition may be recognized by listlessness, a tendency to burrow into the bedding, a characteristic graveyard squeal, coma, and death. Prompt administration of glucose intraperitoneally and of cane sugar *per os* often leads to a high percentage of recoveries.

2) *Iodine Deficiency.*—This condition is characterized by the farrowing of some pigs that are hairless, some with enlargement of the thyroid gland (goiter), and some that are thin and underdeveloped. Some of these may be dead while others will be alive when farrowed but too weak to live. The feeding of iodine to the sow prevents this trouble, and administration to newborn pigs may result in survival of some that would otherwise die.

3) *Inclement Weather.*—Abnormal prolongation of the cold, wet season (as experienced in many parts of the Middlewest in 1947) lowers the resistance to infection. This is especially true if the sows have been maintained on nutritionally marginal rations during gestation or lactation, or if the pigs are housed on premises where latent diseases and parasites may be uncovered.

4) *Faulty Management.*—This factor may be linked with the preceding one. Failure to use pig brooders or artificial

heat may result in chilling, and may be more important in a poor season. Lack of guard rails may also lead to overlaying and crushing of more pigs during periods of unfavorable weather.

5) *Swine Brucellosis.*—Sows infected with *Brucella suis* may abort, early in pregnancy, or they may farrow a high percentage of dead pigs at or near normal time. The blood test will identify the infected herd, but it is not reliable on a single sow basis.

6) *Faulty or Marginal Nutrition During Gestation.*—The pigs may be well grown and in good condition when farrowed, but die between the ages of 4 and 14 days. Surviving pigs may be stunted, rough, and unable to resist parasitic and bacterial invasion. Care in making a diagnosis must be exercised here, for one station reports survival of pigs on rations previously considered inadequate while there were heavy losses among control pigs on rations thought to be completely adequate.

7) *Nutritional Anemia.*—Sows deficient in iron and copper, or pigs raised in such a way that they have no contact with the soil, are affected. The condition is characterized by labored breathing which the farmer calls thumps, and by the fact that frequently the better pigs of the litter—those well grown and in good physical condition—are the first to develop trouble. The hemoglobin reading is very low. Various iron preparations are much more effective and much less of a nuisance than the painting of the udder of the sow with a solution containing iron sulfate and molasses.

8) *Nutritional Gastroenteritis.*—Some reports indicate that portions of the B complex, particularly niacin, have a favorable effect upon the course of certain types of scours in baby pigs. The feeding of niacin in herds where this condition is prevalent often avoids a considerable portion of the pig losses. It is generally believed that this is not likely to be an uncomplicated factor, but may be linked with other deficiencies, with overfeeding, or with the feeding to sows of substances which are transferred to the pigs in the milk in sufficient quantity to upset digestion and cause diarrhea.

9) *Wet Corn Theory.*—In some areas it is believed that the feeding of wet corn to pregnant sows causes baby pig disease. The belief is not well founded, however, because many sows were fed wet corn in 1946 when the percentage of farrowed pigs alive at weaning time was remarkably high, while in 1947 the corn was dry but the livability very low.

10) *Toxemia or Poisonous Milk.*—This condition is found in pigs that are strong and healthy at farrowing, progress normally for a week or ten days, and then die suddenly. Postmortem examination discloses a stomach full of milk. Although no toxic or poisonous factor has been isolated, there appears to be no other logical explanation.

11) *Virus Enteritis.*—At least one report indicates that pigs immunized against hog cholera were not infected by the feeding of viscera from pigs which died of nondysentery enteritis, while control pigs not previously immunized against hog cholera sickened and died. Whether the factor involved is a variant of the hog-cholera virus used in immunizing the pigs or is a separate and distinct factor has not been determined. Additional experimental work is being performed.

12) *Unidentified Virus.*—An additional virus theory comes from another station, where pig losses, starting in pigs 3 days old, spread rapidly to all other pigs in the farrowing house—up to 3 weeks of age—causing a loss of about 90 per cent of the pig crop. A few litters not having contact with the farrowing house have remained uninfected. In this instance, the sows also showed some inappetence, listlessness, and other symptoms, but there were no deaths among the sows. Additional experiments are being conducted with frozen material from these pigs, and a definite answer is hoped for.

13) *Reverse Anaphylaxis.* — This theory holds that sows vaccinated against hog cholera transmit through the placenta certain sensitizing substances. Antibodies against these substances are secreted in the colostrum, and when the sensitized pig consumes the milk the effect is similar to anaphylactic shock. Such pigs develop yellow scours, a characteristic squeal, and they die in from two to five days. Lesions include congestion of the liver and hemorrhages in the adrenal glands. Pigs that survive for five to twenty days develop fatty livers.

14) *Inferior Breeding Stock.*—Gilts that develop slowly are known to be poor

mothers, and this may explain baby pig troubles in some herds where the unusually favorable price situation encouraged the sale of top gilts in the fall of 1946. Then the continued high prices induced owners to hold or to buy inferior gilts from which to raise their 1947 spring litters; often the results were disappointingly poor.

This long list of possible causes of baby pig losses has been compiled to indicate the range of trouble which may exist. It is not inferred that all types will be seen in each community, but further attention is called to the necessity for careful observation in making an accurate diagnosis.

For the veterinarian to cast unwarranted doubt on management factors may embarrass, unnecessarily, the swine breeder. A similar careless remark about nutrition may cause unsubstantiated blame to be thrust upon the ration fed or upon the dealer and manufacturer of a commercial feed of excellent quality. And the offhand mention of a virus factor may immediately be related in the mind of the owner to the only virus with which he is familiar—hog-cholera virus—and which may not be implicated in any way.

The veterinarian is charged with the responsibility of using the best available information to the best possible advantage. To do less means that he is shirking his duty and his opportunity. The best use in this instance consists of a careful study of the history available, the symptoms shown, and the lesions produced—plus, always, an explanation in language that the owner will understand and will not misconstrue.

Christopher Graham—A Versatile Man

Veterinarian, physician, teacher, world authority on differential diagnosis, horticulturist, and cattle breeder: These are a few of the pursuits that are blended into the life of Minnesota's Dr. Christopher Graham, who celebrated his ninety-first birthday on April 3.

Born in Cortland County, New York, he "brought his parents to Minnesota" six weeks after the blessed event. They located northwest of Rochester, on a tract of land—known today as Grahamholm—that was to become world famous.

Dr. Graham received his bachelor's degree from the University of Minnesota in 1887. His professional career began in 1889, when he entered the School of Veterinary Medicine at the University of Pennsylvania, where he graduated in 1892 with his V. M. D. degree. His love for animals had prompted him to study animal medicine. While in veterinary school, however, his real interest centered in physiology, and he decided to study medicine. Inspiration and guidance came from his brother-in-law, Dr. C. H. Mayo, and from Dr. W. J. Mayo. Because of his veterinary background, plus interim studies in bacteriology and other sciences, he received his M. D. degree from the University of Pennsylvania after only one year of medical study.

In 1904, he joined the Mayo brothers as associate in medicine, later specializing in obstetrics, and finally turning his full attention to differential diagnosis. He has become a world-recognized authority on diseases of the stomach and gallbladder, and he credits his basic training in veterinary medicine with being a major factor in developing his procedure for differentiating between gallstones, peptic ulcers, and malignant growths of the stomach and intestines.

Since he retired in 1919, he has devoted his time to horticulture and animal husbandry, his avocations for many years. Today Dr. Graham still occupies himself with the breeding of Holstein-Friesian cattle, though his methods have changed from outcrossing to line breeding and inbreeding, with better and more consistent results. The products of his cattle breeding and horticultural activities have been widely acclaimed, and have made his eventful life even more abundant.

Condensed from an address given by Dr. Hiram E. Essex on May 8, 1946, on the occasion of naming a local Minnesota chapter of the Future Farmers of America in honor of Dr. Graham.

Lucky Horses of 1855.—Dr. A. S. Copeman of Utica, N. Y., second president of the AVMA—1864-1865—wrote fluently on materia medica. In an article in the *American Veterinary Journal*, January, 1856, he named rum, whiskey, brandy, gin, port, sherry, claret, champagne, porter, stout, ale, and lager beer, as particularly useful in equine practice.

Professor Henri-Pierre Vallee

1874-1947

Henri - Pierre - Michel - Archange Vallée (ALF '97), 73, honorary member of the AVMA, died March 12, 1947, at his home in Dijon, Côté-d'Or, France, the site of his birth June 16, 1874, and of his life in retirement since 1930 when a stroke cruelly terminated his labors in the historic laboratory installed by him on the campus of Alfort at the turn of the century. The death of Professor Vallée removes one of the world's most brilliant minds and one of its hardest workers from the precincts of higher scientific research. His professional life is best described as a continuation of Nocard's celebrated activities which began in 1873 and ended with his death in 1903. Vallée was Nocard's *chef de travaux* and his immediate successor as professor of contagious diseases on the Alfort faculty which had already inscribed sensational records in the annals of veterinary medicine on glanders, rabies, anthrax, blackleg *et al.* As it looked, and still looks, from this far-away view, Vallée took over where Nocard left off and never ceased to enliven and enrich the knowledge not only of animal pathology but also of all pathology which was being created *as a science* by the collaboration of the Pasteur Institute and the Alfort laboratories—by the liaison of Pasteur – Nocard – Roux – Chamberland – Callmette – Guerin – Carré – Ramon – Vallée, which completely revolutionized the study of disease. The veterinary links forged into this strong chain are bypassed quite naively in current medical history and are all but forgotten in our own annals.

The passing of this pioneer from the field of virus-disease research reminds both medical and veterinary scientists that the Pasteur-Alfort coöperation impregnated the whole world and gave mankind a foundation upon which to erect *a science of medicine.* There is but to hope that the young veterinarians of this day are still forging links into the chain, and that medicine will cultivate a comparable spirit of interprofessional collaboration. Proof that Pasteur-Alfort coöperation was actual was the appropriation of 150,000 francs in 1900 to install a foot-and-mouth disease research laboratory on the Alfort grounds with the official decree that the "scientific direction shall be under the combined direction of Emile Roux of the Pasteur Institute and Edmond Nocard of the Alfort faculty."* The laboratory building, as many American veterinarians know, is noted for the remarkable ingenuity of its architecture for the special purpose for which it was designed. With the death of Nocard in 1903, this laboratory and his chair in the school fell under the direction of his *chef de travaux,* Professor Vallée, who then and there began his illustrious career. By 1904-1907, in coöperation with his old friend, Henri Carré (ALF '92), the virus of equine infectious anemia (swamp fever) and that of canine distemper had been captured and reported. A few years later, the duality of foot-and-mouth disease was demonstrated. To what extent these discoveries shaped the hog-cholera work of Dorset, Niles, and McBryde, and other researches on filterable microbes, one leaves to the imagination.

His professional life was one of numerous connections: member of the *Académie de Médecine,* past president of the *Académie Vétérinaire de France,* director of *l'École Nationale d'Alfort, chef de service,* Pasteur Institute, honorary member of the AVMA, Commander of the Legion of Honor, officer of the Committee on Veterinary Hygiene and permanent delegate of the French government to the League of Nations, chief of the veterinary sanitary service of the Ministery of Agriculture, and all the while director of the National Laboratory of Veterinary Research, above mentioned. He also gave a series of lectures on foot-and-mouth disease in Buenos Aires following the death of Joseph Leon Lignière (ALF '86) who spent most of his active life in the Argentine in the fields of veterinary research and education at the Veterinary College of Buenos Aires established in 1904.

Professor Vallée was a man of quiet dignity, of commanding stature, of profound intelligence, and of unusual administrative ability, who enjoyed the admiration of his contemporaries above and below his scientific and social level.

Histoire de l'École d'Alfort by Railliet and Moule, (1908) : 788.

My acquaintance with Professor Vallée was limited to the two years spent in France during World War I and to five months spent as a special student at Alfort in the spring and summer of 1919. The courtesy shown me is unforgettable. On reporting for duty (attending Alfort was a military order), Director Vallée convened a faculty meeting at which I was introduced to Cadiot, Railliet, Dechambre, Petit, Moussu, Bourdelle, Coquot, and Kauffman, who did the astonishing thing of planning a curriculum that would best serve the purpose of my sojourn among them. I was, therefore, honored with special lessons in parasitology by Railliet, in anatomy by Bourdelle, in pathology by Gabriel Petit, in zoötechnics by Dechambre, in surgery by Coquot, and the not-to-be forgotten clinics of Cadiot.

The course ended with the presentation of certificate *"En cordial souvenir à notre eminent collègue le Colonel Professor Merillat, chef de le service vétérinaire, 1ère Armée américaine,* along with solemn appreciation by Director Vallée "for the American participation in the liberation of France." A toast was drunk to "The United States, may her greatness never grow less."

Mournful words are out of order in the obituary of so great a man as Professor Vallée. *"Le roi est mort; vive le roi,"* outside of the family circle, is the more fitting reaction.—*L. A. M.*

Rinderpest in History—True and Concentrated

Rinderpest had been dogging eastern civilization since remote antiquity when the predecessors of the Germanic race (the conquering Goths) brought it out of Asia to eastern Europe as far west as the Danube in the second and third century of our era, whereupon the Huns under Attila scattered the cattle plague as far west as Chalon, France (451 A.D.), where they got a worse licking than did Adolph Hitler in 1945. After that historic lambasting, the well-licked legions turned about face and took rinderpest to the Romans.

Everybody knows what happened for the next five centuries—the Dark Ages, or the period of no veterinary history at all. Cattle raising stood still, along with law and order and intelligence and culture. Squalor and poverty took over. By the ninth century, rinderpest raged over all Europe—a gift of the Goths and the Huns. A studious historian tells of 200,000,000 cattle dead of rinderpest. The plague invaded Great Britain in the years 810, 1225, and 1714 *(Vet. Rec.*, Nov. 16, 1946) and sneaked into Belgium for a spell in 1920 and into the Argentine in 1921, only to be quickly exterminated.

Rinderpest led to the founding of veterinary colleges in the eighteenth century (1761), thanks for that. Since then, rinderpest has struck nations in inverse ratio to the attention paid to veterinary education and service. The difference between the backward East and the progressive West is rinderpest.

Material Shipped to the Registry of Veterinary Pathology

It has been brought to the attention of the Committee on the Registry of Veterinary Pathology that contributors to the collection have been sending material to the Registry at the Army Institute of Pathology, express collect. The Committee has been informed that this is contrary to the established policy governing the various registries maintained at the Institute and, therefore, the matter should be brought to the attention of the contributors in the veterinary field. In the future, except in the case of material that is specifically requested, specimens, including material for diagnosis, should be forwarded transportation prepaid.

It is regrettable that a misunderstanding has developed concerning the matter. The chairman of the Committee accepts full responsibility for disseminating the wrong information regarding this procedure.

COMMITTEE ON REGISTRY OF VETERINARY PATHOLOGY
s/WM. H. FELDMAN, *Chairman.*

The quarterly meeting of the American Kennel Club delegates in December (1946) directed that all dog shows held under AKC sponsorship employ "one or more qualified veterinarians."—*From Dog World.*

When John Smith and Miles Standish came to America, the topsoil was about 9 in. deep. Today, it averages about 6 in. across the nation.

Problems of the Poultrymen

TO THE EDITOR:

In your March issue of the JOURNAL (p. 183) there are several unfair remarks which it seems only fair that I bring to your attention.

In the first place, may I say that we feel highly honored to have the JOURNAL pay this much attention to the editorial material in *Poultry Tribune*. It gives us courage to fight even more strongly for the things we consider right.

It may be that we didn't make ourselves clear in our article, another tear sheet of which is attached, but if you will reread our second paragraph, we point out that "On the production side in the Agricultural Research Administration of the United States Department of Agriculture, an untenable relationship still persists. There poultry does not have even the status its marketing work had prior to last year's reorganization. It is only a section in the Animal Husbandry division of the Bureau of Animal Industry. It's truly a BAI stepchild."

Note that the poultry industry has a branch status in the PMA, and only section status in the Bureau of Animal Industry. You have the article confused in the lines at the bottom of the first column on page 183 of your JOURNAL, where you relate the section status to the PMA.

It seems to me that on one hand, you argue that the Bureau of Animal Industry was set up primarily for health purposes, "as the livestock industry's physician," and therefore should not be concerned about basic production problems, to say nothing about distribution, marketing, and price control. On the other hand, you deplore the fact that some of us are seeking more general production aids.

In my presentation, I was trying to point out that the three billion dollar poultry industry with its peculiar production problems deserves more than section status in the Bureau of Animal Industry, particularly since its problems are quite foreign to the general work of the Animal Husbandry Division. We are only asking for a poultry husbandry division in the Bureau of Animal Industry—not a separate bureau.

If the poultry industry can't get aid for its production problems in the Bureau of Animal Industry, to whom shall it turn?

It seems to me that your editorial criticism does not comprehend the actual problems as they relate to the current organization of the Department of Agriculture.

Yours sincerely,
POULTRY TRIBUNE
s/O. A. HANKE, *Editorial Director.*

The editorial in question, however clumsy, was a sympathetic, noncritical approach of the poultryman's problem which, as pointed out, is "entangled, confused, and involved." The purpose was to show that the commercial facets of the various branchings of animal production (distribution, marketing, and price control) tend to become more and more incompatible with one another and most assuredly with the medical problems involved. Speaking only for veterinary medicine, the medical problems generally lacked the wholehearted support of the purely commercial interests. They tug at each other and, therefore, should be operated under separate general management, each bent on planning and promoting to mutual advantage. But for the fact that the commercial facets are extra-curricular, no remedy was proposed except for the suggestion that they might fit better in the Department of Commerce than in a division of the Bureau of Animal Industry in the Department of Agriculture.

Our editorial held out the U.S. BAI as the "livestock industry's physician" and also as a bureau that has been saddled with important duties foreign to the practice of medicine, such as "distribution, marketing, and price controls," because no other administration had been provided for these while animal industry and its relative importance were rapidly mounting to their present level in national and international affairs. The forming of a new bureau for the poultry industry was frowned upon, but no particular objection was raised to a separate poultry division within the Bureau in keeping with the present trend, although that would bring in a $3 billion industry for a scientific branch of the government to administer. Let the political economists decide on that. The meat of the thesis is that the problem of the poultryman, like that of the other branches of domestic animal industry, is "entangled, confused, and involved," because its affairs are more closely interwoven with disease than commerce seems to realize, and knowledge of the two is not interchangeable.—THE EDITORS.

Carcass Grading.—Livestock marketing organizations object to the selling of livestock by carcass grade because (quoting) "There aren't two graders anywhere, government men or others, who agree exactly on grade. Who then would set the price?"

CURRENT LITERATURE

ABSTRACTS

Newcastle Disease (Pneumoencephalitis) Virus in Syrian Hamsters

A California strain of Newcastle disease (pneumoencephalitis) virus was successfully carried serially through 12 Syrian hamster brain passages, as related in the first report that such virus will grow in hosts other than fowl. The method of conducting the experiment and the symptoms produced in hamsters are reported in detail. Experiments are being conducted to determine whether or not the virus has been modified sufficiently to permit its use for the vaccination of chickens.—[*R. L. Reagan, Mary G. Lillie, L. J. Poelma, and A. L. Brueckner: Transmission of the Virus of Newcastle Disease to the Syrian Hamster. Am. J. Vet. Res., 8, (Jan., 1947): 136-138.*]

Plasma Fractions from Domestic Livestock

A bioassay of the neutralizing value of the *gamma* globulin fraction derived from plasma of abattoir pigs showed that 35-lb. pigs were protected from 2 cc. of hog-cholera virus by 4 cc. of the fraction.

The same material agglutinated *Brucella abortus* and *Brucella suis* at a titer of 1 : 160. The fraction from bovine plasma gave a titer of 1 : 1,280. Agglutinins for Brucella and for staphylococcic antitoxin are contained in the *gamma* globulin but are absent from the other fractions.—[*H. S. Cameron: Immunologic and Clinical Studies on Plasma Fractions from Domestic Livestock. Am. J. Vet. Res., 8, (Apr., 1947): 153-156.*]

Acute Leucemic Myelosis in Swine

A 3-month-old pig developed posterior paralysis. For two weeks, the animal continued to eat well and had no other symptoms until the beginning of the third week when it started to lose weight and become weaker. It was killed at the end of the third week, and the carcass and most of the organs were sent to a laboratory. There was generalized lymphadenopathy, and numerous white, firm tumors of varying size were found in the periosteum of ribs, humeri, scapulae, and the skull. The tumor was present in the spongy substance of vertebrae with extension into the epidural space. There was also involvement of long bones. Tumors were found in the kidneys and liver. The spleen was not available for examination. The tumors consisted of myeloblasts, promyelocytes, and myelocytes. The cytoplasm was less abundant than normally seen in these cells, and the more mature had eosinophilic granules. Many immature cells were seen within blood vessels. The oxidase test was negative.—[*A. Isaksson: Ett fall av akut leukemisk hos svin. Skand. Vet.-tidskr., 36, (Nov., 1946): 663-674, 5 fig.*]

A. G. KARLSON

Botulism in Dogs

In America, Dickson (1918), Graham and Erickson (1922), and in France, Legroux and Levaditi (1946) reported their researches on alimentary botulinus intoxication in dogs, using types A and B. The Americans were first to study the problem. Graham and Erickson found that subcutaneous injection of type A in doses of 1 to 10 cc. in dogs produced ocular symptoms and that often from 60- to 100-cc. doses were fatal. On the contrary, type B toxin did not produce any pathologic manifestations. Being sensitive to type A and refractory to type B, the dog was regarded as an excellent animal for differentiating between the two types. Curiously, Legroux and Levaditi, in experiments on 26 dogs with toxin obtained from Karl F. Meyer, found 7-cc. doses of type A to be pathogenic and sometimes lethal; contrary to the research of Graham and Erickson, the m.l.d. of type B given intramuscularly, intravenously, and intraperitoneally was 3 cc. However, 60 cc. of type B *per os* was tolerated even when given with fragments of bone to excoriate the intestinal mucosa. Moreover, a mixture of types A and B that rapidly killed guinea pigs was harmless for dogs. The discrepancy between the two findings is less important than the fact that botulism from both types does exist in dogs, experimentally. Three typical cases naturally acquired are described.—[*F. Mery: La Botulisme chez le Chien. Bull. Acad. Vét. de France, 20, (Jan., 1947):28-37.*]

Penicillin Assay Following Intramammary Injection

All four quarters of the mammary glands of 45 cows were infused with five dosage levels of penicillin given in three different amounts of diluent. Assays for penicillin made at two-hour intervals for eight hours following infusion indicate that the stage of lactation and the extent of induration have a direct influence on the concentration of penicillin remaining eight hours after infusion.

On the basis of this investigation, 100 cc. or 50 cc. of diluent was the best quantity to use, depending upon the stage of lactation. Variation in the penicillin assays was lowest when

using 100 cc. of diluent and greatest when using 20 cc.

When infused immediately following the last milking at the end of the lactation period, penicillin remained in the mammary glands of the dry cows for forty-eight hours in all quarters and for seventy-two hours in 75 per cent of the quarters.

When 200,000 units per quarter were injected rather than 100,000 units, the increase in concentration of penicillin did not justify the higher dosage.

Tolerance to penicillin varies widely among the Lancefield groups, some being unable to tolerate as little as 1 unit/cc. while others would tolerate at least 200 units/cc.—[*W. T. S. Thorp, Irene J. Uhrik, and E. J. Straley: Concentrations of Penicillin in the Bovine Mammary Gland Following Infusion and the Penicillin Tolerance of Certain Streptococci. Am. J. Vet. Res., 8, (Apr., 1947): 157-165.*]

Permanent Enteric Fistulas in Ruminants

Cattle lend themselves to the establishment of permanent enteric fistulas from which samples of ingesta may be drawn at frequent intervals from many different portions of the tract while the group is being fed any ration of choice.

A group of cattle having rumen, small intestine, cecum, and colon fistulas offered living laboratories for the study of digestive and assimilative processes on various rations, and of pharmacodynamic phenomena.—[*R. E. Nichols: Permanent Enteric Fistulas for Studies of Ruminant Digestion, Assimilation, and Elimination. Am. J. Vet. Res., 8, (Apr., 1947): 166-167.*]

Blood Chemistry in Periodic Ophthalmia

Detailed studies were completed on the chemical composition and cellular elements of the blood of normal horses and those affected with periodic ophthalmia (recurrent iridocyclitis). Affected horses showed a pronounced decrease in glucose tolerance. Significant deviations were found in the serum proteins; the globulins were usually increased at the expense of the albumin. Protein fractionation yielded variable results.

No significant deviations were observed in the blood content of nonprotein nitrogen, urea, creatinine, uric acid, glucose, chlorides, cholesterol, inorganic phosphorus, calcium, potassium, phosphatase, bilirubin, icterus index, total serum proteins, or fibrinogen.

Relative lymphocytosis, with concurrent neutropenia, was the outstanding change found in the blood picture, and this was sometimes accentuated during the acute stage of the disease. No significant abnormalities were detected in the erythrocyte count or hemoglobin values, nor were the numbers of basophils, eosinophils, or monocytes affected. No change was found in the Schilling classification of the neutrophils.—[*T. O. Roby and T. C. Jones: The Blood in Equine Periodic Ophthalmia. Am. J. Vet. Res., 8, (Apr., 1947): 145-152.*]

Botulism

The different types of *Clostridium botulinus* are classified on the specificity of their toxins which are identified by the use of monovalent antitoxins in neutralization tests. There is too much variation among specific types to use differential mediums for classification. Botulism in herbivorous animals has been explained on the basis that in areas of calcium deficiency the animals will eat bits of bone found in the soil. If these bones are from putrified carcasses, they may contain sufficient toxin of botulism to produce the disease. In other cases botulism has been blamed on the presence of dead rodents in hay or other fodder. The botulism bacillus produces toxin in the decaying tissues in sufficient quantity to contaminate the surrounding hay. The author believes that a more plausible explanation for botulism occurring in hay-fed animals is that spores of the bacilli are ever-present in hay and will grow to form toxin when the proper conditions of moisture and temperature are present. Aërobic bacteria will develop first in warm, moist fodder and will deplete the oxygen supply, thus allowing the anaërobic botulinus bacillus to grow.—[*L. M. Geurden (University of Ghent): Vergelykende onderzoekingen over botulisme en botulinus-bacillen (Comparative Study on Botulism and Botulinus Bacilli). Koninklijke Vlaamse Acad. Geneesk, van Belgie, 7, (1946): 121-143.*]

ALFRED G. KARLSON

Ornithosis in Pigeons

Out of 146 so-called wild pigeons obtained in three Ontario cities, 24 were found to be seropositive to test with psittacosis antigens. A viral agent morphologically and tinctorially identical with psittacosis virus was isolated from over half of the reactors. All of the strains isolated were uniformly pathogenic for mice by the intracerebral route, but with one exception they failed to produce fatal disease by the intraperitoneal route. From this study, it appears that pigeons are an important reservoir of the virus, although it was not determined to what extent they may transmit the infection to man.—[*N. A. Labzoffsky: Ornithosis Among "Wild" Pigeons in Ontario. Canad. J. Pub. Health, 38, (Apr., 1947): 187-192.*]

Diagnosis of Lymphomatosis

A serologic test has been developed that may prove of value in detecting avian lymphomatosis, especially the visceral manifestation, which is difficult if not impossible to diagnose clinically. The test is recommended for use only on birds 3 months of age or older, since the results are not reliable in younger birds.

Fundamentals of the procedure are that chickens affected with lymphomatosis produce agglutinins against normal lymphocytes and that these agglutinins can be demonstrated by the rapid plate agglutination method. Washed, stained canine lymphocytes are used as the antigen. There should be 50,000 cells per cubic millimeter of antigen. The optimum acidity is pH7 and the optimum temperature for the reaction is 37 C. No cross agglutination with other disease entities was observed.

The ocular, neural, and visceral manifestations appear to produce lymphocyte agglutinins with equal regularity. Birds with osteopetrotic lymphomatosis were not available for study.—[*R. E. Kissling: Leukoagglutination as a Serological Diagnosis for Avian Lymphomatosis. Poultry Sci., 26, (Jan., 1947): 74-77.*]

Mineral Deficiency among Finnish Cattle Evacuated to Northern Sweden

The incidence of paresis in cattle becomes low when feed concentrates become scarce as during periods of war. About 15,000 cattle were moved from Lapland to northern Sweden during the war between Finland and Germany. These animals had had low-protein diets and were in poor condition due to the stress of forced drives. When the milk cows were placed on a diet that contained much more protein than they were accustomed to, the incidence of paresis, both parturient and nonparturient, rose rapidly. There were 236 cases of parturient paresis and 214 of nonparturient paresis, or a total of 32 per cent of the milk cows with the disease. The mortality of animals with parturient paresis was about 10 per cent, and for the nonparturient cases it was about 33 per cent. Intravenous calcium preparation, air-insufflation of the udder, and the use of vitamins A, B, and D, were not always successful. The incidence of paresis was greatest where the diet was richest in protein and deficient in hay and minerals. Where good quality hay was fed with the diet the incidence of the disease was low. Blood levels of calcium, phosphates, and vitamin A were found to be low in most cases, but low blood calcium did not always result in paresis nor did all cases have low values for blood calcium. In cases with a good prognosis the calcium level returned to normal, and the phosphate and vitamin A levels increased following injections of calcium preparations. If the phosphate levels did not rise, the prognosis was poor. This detailed report has 11 tables and 50 references to the literature.—[*H. Westermarck: Mineral Deficiency and High Protein Content of the Feed as a Cause of Paresis among Finnish Cattle Evacuated to Northern Sweden. (In Swedish.) Finsk Vet.-tidskr., 52, (1946): 71-110.*]

A. G. KARLSON

Mastitis in Buffaloes

Examination of incubated milk samples from 3,322 buffaloes (caribous) on various farms in Lahore (India) revealed that about 16 per cent of the animals were infected with streptococcic mastitis, and a small percentage with other types of organisms. Apparently, infected buffaloes excrete streptococci intermittently, since as many as 50 per cent of known infected animals may be negative to a given test.

The investigators noted that the incidence of mastitis increased with age and that the early stage of lactation is the time of greatest susceptibility.—[*F. W. Priestley and D. Artioli: Streptococcus Mastitis in Buffaloes. Indian J. Vet. Sci. & Anim. Husb., 15, (Dec., 1945): 255-261.*]

Lymphoid Tumors in Chickens

Since 1939, lymphomatosis of chickens has been under study at the Regional Poultry Research Laboratory at East Lansing, Mich. The disease is of major importance to the poultry industry because few flocks in the United States have escaped its ravages.

Lymphomatosis is a naturally occurring malignant disease characterized by the formation of lymphoid tumors that may be found in nearly all tissues of the bird's body. It is apparently communicable and may be transmitted under natural conditions both through the egg and by bird-to-bird contact.

In the East Lansing investigations, breeding for resistance to this disease was found to be useful and practical. Within a few generations, through selection with intense inbreeding, groups of chickens were segregated which were resistant to, or susceptible to, naturally occurring lymphomatosis. It was found, however, that before resistant or susceptible birds can express their genetic possibilities, they must be exposed to the agent or agents of the disease.—[*N. F. Waters: The Occurrence of Lymphoid Tumors in Resistant and Susceptible Chickens. J. Hered., 37, (Sept., 1946): 281-283.*]

Antigenic Relationship between Mycobacterium and Corynebacterium

Goats injected with *Corynebacterium pseudotuberculosis* failed to react when tested with johnin and hominis tuberculin. Diphtheria toxin was not neutralized by serums from apparently normal cattle nor from cattle highly sensitized to five species of Mycobacterium.—[*Aubrey B. Larsen and Howard W. Johnson: Antigenic Relationship between the Genus Mycobacterium and the Genus Corynebacterium in Goats and Cattle. Am. J. Vet. Res., 8, (Apr., 1947): 184-185.*]

Phenothiazine in Trichostrongylosis

A group of 117 ram lambs affected with trichostrongylosis as evidenced by necropsies and fecal egg counts were divided at random into two lots and moved from an irrigated pasture to corrals on dry feed. Fecal egg counts were taken from all the lambs and average weights from each lot. One lot was treated with 37.5 Gm. phenothiazine, and the other served as a control.

The treated lambs had lower fecal egg counts than did the controls 13, 30, 69, and 90 days after treatment, indicating removal of a high percentage of trichostrongyles. Although all of the lambs showed good average weight gains, the treated lot showed statistically significantly greater increase 18, 30, 60, 90, and 120 days after treatment—and a better quality when marketed. There was no significant difference in fleece weights, but the quality of the wool was better in the treated lot—[*Lee Seghetti and Hadleigh Marsh: Experimental Treatment of Trichostrongylosis in Sheep with Phenothiazine. Am. J. Vet. Res., 8, (Apr., 1947): 186-191.*]

Avian Tuberculosis in a Cow and Congenital Tuberculosis in the Calf

A herd of cattle had no reactors to tuberculin in the years 1937, 1939, 1941, or 1944. In 1946 a month-old calf from this herd was found to have extensive caseous and calcified lesions in the lungs and hepatic lymph nodes. These lesions were considered to be congenital. Tubercle bacilli from the tissues were typed and found to be avian. The dam was slaughtered, found to have metritis, and smears of the endometrium and exudate revealed tubercle bacilli. There were no other lesions of tuberculosis. The cow had had a difficult labor in 1945, and a number of persons on the farm assisted in the delivery. It was thought that the cow could have been infected at that time. The chickens had free range on the entire farm, and there had been sporadic deaths among them. One dead chicken was found to have a ruptured tuberculous liver which had innumerable tubercle bacilli. The cattle were tested eight months following the slaughter of the cow with tuberculous metritis, but no reactions were found.—[*Kurt Allansson: Avian Tuberculosis in a Cow and Congenital Tuberculosis in the Calf. Skand. Vet.-tidskr., 38, (Dec., 1946): 742-746.*]

A. G. KARLSON

Local Meat Inspection

Because veterinarians are frequently called upon to help organize and direct municipal meat inspection services, it is important that they keep informed of current practices and trends in this field.

To this end, it is pointed out that federal inspectors are always willing to give help and advice to local organizations, particularly with regard to inspection techniques and operating procedures.

The author gives a comprehensive listing of the obligations and problems that confront the administrators of a municipal inspection service, with emphasis on antemortem and postmortem inspection.—[*G. W. Riley: Municipal Meat Inspection. Auburn Vet., 2, (Summer, 1946): 113-115 and 126-128.*]

Vibrionic Abortion in Cattle

Of 20 fetuses in which *Vibrio fetus* was found, 10 were positive by direct microscopic examination, 10 by culturing stomach fluid on blood agar, and 17 by culturing in soft agar. The agglutinin titers of serums from the aborting cows were: one, less than 1 : 200; two, 1 : 200; ten, 1 : 400; three, 1 : 800; two, 1 : 1,600; and two, 1 : 3,200.

Of 52 serums from cows that aborted *V. fetus*-negative fetuses, 36 gave titers of less than 1 : 200; ten, 1 : 200; four, 1 : 400; and two, 1 : 800. These data suggest that a titer of less than 1 : 200 should be classed as negative, 1 : 200 as suspicious, and 1 : 400 or higher as positive. Of 188 blood samples from brucellosis-free aborting cows, 39 per cent gave titers of 1 : 400 or higher when tested with *V. fetus* antigen.

Records on ten *V. fetus*-infected herds showed that the annual abortion rate varied from 4 to 20 per cent and the incidence of positive reactors on initial test from 10 to 60 per cent.

Of 26 cows that became positive during the last half of gestation, 42 per cent aborted; of 38 that were positive and became negative by the fourth month, 3 per cent aborted; and of 72 cows positive during the entire gestation, 7 per cent aborted. A lowered conception rate occurred in five herds following the occurrence of vibrionic abortion. Agglutinin titers from 1 : 400 to 1 : 1,600 were observed in 5 of 6 bulls in herds that were mated naturally.—[*W. N. Plastridge, L. F. Williams, and Dorothy Petrie: Vibrionic Abortion in Cattle. Am. J. Vet. Res., 8, (Apr., 1947): 178-183.*]

Diffuse Placenta in a Cow

The author was called to remove the retained membranes from a 12-year-old cow on the third day following a normal parturition. Instead of being able to palpate cotyledons as the hand was passed between chorion and endometrium, it was found that there was a diffuse attachment. The membranes were easily separated from the uterus. Only three well-formed cotyledons were found, and these were at the anterior end of the chorion. There were three corresponding caruncles on the uterine wall. This anomalous development of the placenta had no effect on gestation or development of the fetus. It probably resulted from forceful removal of retained membranes by an inexperienced person at the previous parturition.—[*Hans Gebauer: Diffuse Placenta in a Cow. Berl. und Münch. tierärztl. Wchnschr., 3, (March, 1947): 30.*]

A. G. KARLSON

Toxicity of Sulfamerazine

Chickens which received sulfamerazine in the mash at levels of from 0.25 to 1.5 per cent, or in 0.5-Gm. daily doses, for seven days made poorer weight gains than the untreated controls. The retardation in weight gain was attributed to unpalatability and to the toxic effects of the drug. The experimental birds consisted of 116 Rhode Island Red and 63 New Hampshire chickens, 16 to 43 days old. More damage to the spleen resulted in the birds that were 43 days old than in those 16 to 30 days old.—[*M. M. Farr and D. S. Jaquette: The Toxicity of Sulfamerazine for Chickens. Am. J. Vet. Res., 8, (Apr., 1947): 216-220.*]

The Chemotherapy of Cecal Coccidiosis

The use of a 0.2 per cent sodium sulfamerazine drinking water solution, given at the first symptoms of cecal coccidiosis, lowered the mortality. In field trials, it controlled outbreaks of cecal coccidiosis. This solution had prophylactic properties and did not appear to affect the production of immunity to the strain of *Eimeria tenella* used in the experiments. A mash containing 0.25 per cent sulfamerazine had similar prophylactic effect without interfering with the immunity response.

Neither of the treatments affected gains ap-

preciably, but when a 1.0 per cent sulfamerazine mash was used an adverse effect was noted on the average gains. There was no consistent pattern regarding the lesions observed in the spleen and liver, nor were these lesions consistently related to dosage with sulfamerazine following infection with cecal coccidiosis. Gross lesions occurred in the spleen about three times as often as in the liver, but they were found among both untreated and treated chickens.—[*W. T. S. Thorp, S. Gordeuk, Jr., P. J. Glantz, and M. Learned: The Chemotherapy of Cecal Coccidiosis. Am. J. Vet. Res., 8, (Apr., 1947): 196-203.*]

Strains of Salmonella Pullorum

Antigens prepared from regular strains of *Salmonella pullorum* did not detect all birds infected with variant strains. Consequently, a mixed, stained antigen was prepared from regular and variant strains and reports from the use of some 3.5 million doses indicate that results were good. A mixed tube antigen was less satisfactory.

The regular strains can be distinguished from the variants only by serologic methods. Details of the differential procedure are given. Of 88 recently isolated strains, 20 were of the variant type. There was no evidence of change in variant types after two years, nor were they affected by animal passage.—[*R. Gwatkin: Studies in Pullorum Disease. XII. Antigenic Differences in Strains of Salmonella Pullorum. Am. J. Vet. Res., 8, (Apr., 1947): 204-208.*]

Escherichia Coli from Cases of Fowl Paralysis

Escherichia coli was isolated from adult hens visibly affected with the ocular form of fowl paralysis. Blood from 37 donor hens was cultured, and *E. coli* was isolated from 5 (13%) of these donors. When 1 cc. amounts of the blood of these 5 hens were injected into day-old chicks, 84 of the 85 chicks injected died.

The culture was identified as belonging to the 0 group.—[*A. J. Durant and H. C. McDougle: Escherichia Coli in the Blood Stream of Adult Fowl Affected with the Ocular Form of Fowl Paralysis. Am. J. Vet. Res., 8, (Apr., 1947): 213-215.*]

Staphylococcic Resistance to Penicillin

Staphylococci were isolated more than twice as frequently as were streptococci from milk from chronic cases of bovine mastitis in the state of Washington. The intramammary infusion of a total of 400,000 Oxford units per quarter, given in four infusions of 100,000 units at approximately twelve-hour intervals after each of four successive milkings, was followed by only a temporary reduction in the number of staphylococci shed in the milk of ten treated quarters of 7 cows.

The infusion of the large amounts of penicillin was not followed by any clinical evidence of irritation nor increase in either the chloride content or electrical conductivity of the milk, nor was the milk yield significantly reduced during or following the series of infusions.—[*E. C. McCulloch: The Resistance of Chronic Staphylococcic Bovine Mastitis to Massive Penicillin Therapy. Am. J. Vet. Res., 8, (Apr., 1947): 173-177.*]

Streptomycin in Brucellosis

In six different tests, guinea pigs were experimentally inoculated with 10,000, 50,000, or 1,000,000 *Brucella abortus* organisms. They were then treated with streptomycin at various dosage levels and at varying intervals.

As used in these experiments, streptomycin failed to overcome or prevent brucellosis. It did have a marked bacteriostatic effect on the course of the infection in many of the animals used, particularly when treatment was prolonged. It is very probable that, had the drug been injected intramuscularly or subcutaneously to retard absorption, and had the treatment continued over longer periods, the results might have been more favorable.—[*H. L. Gilman and W. R. LeGrow: Streptomycin in the Treatment of Experimental Brucellosis in Guinea Pigs. Am. J. Vet. Res., 8, (Apr., 1947): 192-195.*]

Alkalosis in Milk Fever

Cases of milk fever (parturient paresis) treated with intravenous calcium gluconate showed serum calcium increases twenty-four hours later but 50 per cent relapses. Supplementary feeding of Chlor-Ethamine (Pitman-Moore) after calcium injection resulted in greater calcium increases and virtually no relapses.

It is suggested that the symptoms of milk fever may be attributed to a physiologic alkalosis occurring with the onset of lactation, while hypocalcemia is a symptom of secondary importance. The acetonemia evident in some of these cases may be another manifestation of alkalosis.—[*A. H. Craige, Jr., and L. V. Stoll: Milk Fever (Parturient Paresis) as a Manifestation of Alkalosis. Am. J. Vet. Res., 8, (Apr., 1947): 168-172.*]

Infectious Bronchitis Virus Cultivation

Experiments were conducted on the effect of freezing and thawing normal and bronchitis-infected allantoic fluid, on titration of embryo m. l. d., on diluents for titration, on the effect of the amount of inoculum on embryo mortality and titer, and on lyophilization.

Freezing and thawing did not appreciably affect normal serum, but in bronchitis-infected serum it produced two types of precipitate—one soluble at room temperature, the other insoluble under the same conditions. The methods of titrating for m. l. d., the diluents used, and the effects on mortality and titer of the embryo are discussed in detail. Virus which had been dehydrated at 0.15 mm. mercury pressure for eight hours, sealed *in vacuo*, and stored at 4 C. for seven days had a hundredfold decrease

of activity when restored to volume.—[*C. H. Cunningham and H. O. Stuart: Cultivation of the Virus of Infectious Bronchitis of Chickens in Embryonated Chicken Eggs. Am. J. Vet. Res., 8, (Apr., 1947): 209-212.*]

BOOKS AND REPORTS

Methods of Vitamin Assay

A compilation of the work of 33 reviewers who discuss the collection of samples for assay, and describe in detail the numerous analytical methods and procedures, is available. Chemical equations, structural formulas, and quantitative calculations are of such complexity as to carry the presentation of vitamin methodology beyond the limits of this reviewer's knowledge. The book does illustrate the fact that many chemical tests which can be conducted in a comparatively short space of time have replaced the biologic assays which involved weeks and months of laborious animal feeding experiments, at least in establishing the basic principles and in determining in a general way the presence or absence of such substances as vitamin A, carotene, thiamin, riboflavin, niacin, ascorbic acid, and others. Whether the substances shown by chemical methods to be present can be assimilated and metabolised by the animal may still remain to be proved, but this is often comparatively simple once the chemical analysis has been completed.—[*Methods of Vitamin Assay. Prepared and edited by the Association of Vitamin Chemists, Inc. 189 pages, cloth. 1947. Interscience Publishers, Inc., New York. Price $3.50.*]

Proceedings of the British West Indian Veterinary Conference, 1947

This is a comprehensive report of a conference of the veterinarians of the British West Indies held at Hope, Jamaica, Feb. 25 to March 9, 1947. The delegates represented Jamaica, Trinidad, Leeward Islands, Barbadoes, Bahamas, British Guiana, and the Windward Islands. The inventory of the livestock in Jamaica alone is:

Horses, 13,306	Mules, 25,462
Donkeys, 51,241	Cattle, 229,658
Sheep, 12,706	Goats, 260,752
Rabbits, 43,160	Swine, 217,985
Guinea pigs, 15,521	Poultry, 1,660,311
Other fowl, 73,542	

Diseases laid out for severe control measures were bovine piroplasmosis (Texas fever), anaplasmosis, anthrax, hog cholera, tuberculosis, trypanosomiasis, paratuberculous enteritis (Johne's disease), paralytic rabies, brucellosis, foot-and-mouth disease, equine encephalomyelitis, worm parasites, and dietary deficiencies. The general laws and special regulations on the handling of these diseases are well documented in the various discourses brought before the conference. The marvel of the situation as gleaned from the individual papers is the discipline that enables so small a group of veterinarians to achieve so good a control over this gamut of livestock infections. In short, the B.W.I. has a pragmatic veterinary service, the kind that makes and respects good neighbors.

The paralytic disease of cattle, which was first recognized in Trinidad several years ago as bat-borne rabies, occupied considerable attention. But what catches the eye more vividly are the outbreaks of hog cholera which, according to this report, followed the American troops. The B.W.I. restrict their importations of pork to Canada where hog cholera is practically nonexistent. The contents of this well-organized material greatly augments our knowledge of the livestock sanitary work of this hemisphere. —[*Record of the Proceedings of the British West Indian Veterinary Conference. Edited by the secretary, Dr. R. M. Arnold, Department of Agriculture, Jamaica, B.W.I. 136 multigraphed pages.*]

Annual Report, Leeward Islands Department of Agriculture

Notable among the world's accelerated agriculture are the British activities in the Leeward Islands colonies. L. R. Hutson, M.R.C.V.S., chief veterinary officer in charge, gives a comprehensive account of the land settlement project, soil conservation, peasant instruction, farming, and animal production of the principal islands of the group—St. Kitts, Montserrat, Antigua, Nevis, Virgin Islands (Br.)—where expansion of farming, started as a war measure, continues to obviously good advantage to all concerned. On Antigua, for example, 20 settlements developed 9,178 additional acres and established livestock inspection and meat inspection systems, and a cattle dipping service.

The farm animals mentioned in the report are jacks and jennets, light draft French Canadian horses, native riding horses, Red Poll, Senegal, and Holstein-Friesian cattle, Berkshire and Duroc-Jersey hogs, Rhode Island Red chickens, sheep, goats, donkeys, and mules. All being necessary to the development at hand and susceptible to the usual run of diseases overtaking domesticated fauna, the wisdom of placing farm rehabilitation projects under the direction of a veterinary officer is shown in the progress being made by the agricultural industry of the Leeward Islands, not to mention the informative character of the report.—[*Leeward Islands, Annual Report of the Department of Agriculture for 1945. Compiled by L. R. Hutson, Chief Veterinary Officer. 22 pages, 13" by 8." Public document.*]

Food Regulation and Compliance

This second volume deals with adulteration of foods, using this term in the broad sense of harmful substances added, contaminated foods, addition of colors, and the omission of valuable constituents. It goes on to discuss methods of inspection, sampling, and enforcement; processes for making seizures and instituting injunctive proceedings.

Whereas Volume I had concerned itself chiefly with the history of food regulation,

and the federal and state statutes which have been passed to insure compliance with the basic standards in so far as these concern the package which actually reaches the consumer, this volume enters the larger sphere of production, processing, packaging, and storing of foods. Instead of being chiefly interested in the label carried on the ultimate retail package, Volume II directs its attention to the methods and processes whereby adulterated products, deleterious, and unwholesome foods may be detected and diverted from the markets.

For the veterinarian in food inspection and public health work, this book provides a wealth of pertinent information; here cases are discussed plainly, and the procedures and results are carefully documented with court records.—[*Food Regulation and Compliance. By Arthur D. Herrick. Vol. II. 640 pages, cloth. 1947. Revere Publishing Co., New York. Price not listed.*]

Trace Elements in Plants and Animals

The significance of trace elements (zinc, copper, molybdenum, cobalt, boron, manganese, *et al.)* in plants and animals, a subject of increasing importance in veterinary medicine, is digested in this brief monograph in respect to their amounts, their physiologic need, their excess, and the inadequate knowledge of the subject. The chapter on animal nutrition is an inescapable part of scientific veterinary medicine, especially of nutrition. This small book is invaluable to the soil chemist, animal husbandman, and veterinarian seeking to keep abreast of the times in the health and the pathology of plants and animals.—[*Trace Elements in Plants and Animals. By Walter Stiles, Cambridge, England. 189 pages. Macmillan & Company, New York. Price $2.75.*]

Antibiotic Substances

In the first edition of this book, the author traced the history of the broad interrelationships among microörganisms living in association. Beginning with the discovery by Pasteur that microbes are responsible for certain human, animal, and plant diseases, and the later discovery that other organisms (designated as antagonists) are able to combat and even destroy the disease-producing agents, the unfolding of present day information is traced, step by step.

These interrelationships may vary all the way from true parasitism (one organism living in or upon the body of another) to true saprophytism (one organism merely destroying the waste products and dead cells of another without detriment to the host and with possible benefit to both organisms).

The antibiotic substances of greatest interest are those which attack the organisms responsible for disease in man or in the plants and animals which he uses for food. Penicillin is the best known antibiotic substance, and this book presents the information which has been gathered about it since the first edition appeared in 1943.

More than 50 antibiotic substances are discussed, giving in each instance the organism which produces it, the organisms against which it is effective, its chemical composition and characteristics, and its effect upon the morphology and physiology of the bacterial cell attacked.

The book is an excellent one for every veterinarian who is keeping abreast of the progress being made in the treatment and eradication of diseases of animals and of man.—[*Microbial Antagonisms and Antibiotic Substances. By Selman A. Waksman. 415 pages, illustrated, cloth. The Commonwealth Fund, New York. Price $4.00.*]

Laws About Dogs

Editor Will Judy, who is a member of the Chicago bar, has just turned out the fifth edition of his brochure on canine jurisprudence. It starts with the historical background of laws concerning dogs and brings the reader up to date on the legal rights and responsibilities of owners and of the general public in relation to dogs. Also discussed are laws that bear specially on breeders, kennelmen, exhibitors, dealers, and veterinarians. A model dog law is offered for the guidance of local governments.

Veterinarians in every branch of the profession will find this a useful manual that asks little of the bankroll and library-shelf space.—[*Laws About Dogs. By Capt. Will Judy. 16 pages, paper. 1947. Judy Publishing Company, Chicago. Price 30 cents.*]

Control of Sheep Stomach and Nodular Worms

This is a circular of the Ontario Department of Agriculture giving a brief account of the proper use of phenothiazine in the handling of stomach worms and nodular worms in the sheep of that province. The orthodox methods governing the use of this drug are faithfully told including its use in the form of medicated salt. Warnings that phenothiazine must be used "with intelligence" and to consult the veterinarian if available are given.—[*The Control of Sheep Stomach and Nodular Worms. By A. A. Kingscote, V.S., D.V.Sc., Ontario Veterinary College, Guelph. Extension Circular 74. March, 1947. Ontario Department of Agriculture, Statistics and Publications Branch, Toronto.*]

Science in Farming

This yearbook of the United States Department of Agriculture, covering the years 1943 to 1947, is a worthy addition to the growing series of such volumes. Whereas its immediate predecessor, the 1942 yearbook, was devoted entirely to Keeping Livestock Healthy, the present volume covers a much wider range of farming. It discusses the development and application of scientific progress "pertaining to animals, plants, insects, trees, soils, water, machines, conservation, processes, marketing, industrial uses of farm products, agricultural chemistry, food, clothing, and economics."

Many of the subjects dealt with in this

book will be of interest to practising veterinarians because of the close relationship between good soil and proper nutrition of animals, and then between this state of complete nourishment of livestock and the maintenance of a high standard of human as well as animal health.

Approximately 150 authors have contributed to present the up-to-the-minute information on the application of science to modern farming. Good pictures of typical examples of many of the conditions discussed help to tell a complete story, and to tell it well.—[*Science in Farming. Yearbook of Agriculture, 1943 to 1947. 940 pages, cloth, illustrated. Superintendent of Documents, Washington, D. C. Price $2.00.*]

Exotic Veterinary Medicine

France has resumed publication (suspended since 1940) of *Recueil de Médecine Vétérinaire Exotique* and has broadened its usefulness.

The name is changed to *Revue d'Élevage et de Médecine Vétérinaire des Pays Tropicaux* (Review of Animal Breeding and Veterinary Medicine in Tropical Countries). Volume I, No. I, has just arrived from the publishers, Vigot Frères of Paris. The first issue of the renamed organ reveals the general character of the material in respect to leading articles, clinical reports, abstracts, and professional news. Translated, the main features are:

1) Vaccination against rinderpest in Sudan with the aid of goat virus.
2) Notes on the morphology of *Trypanosoma suis*, Ochmann. Illustrated.
3) Anatomic tests on the adaptation of the camel to the desert.
4) The ox *(Bos taurus Bolensis)* of Lake Tchad; the most interesting cattle of Africa. Illustrated.
5) Review of Donatien, Plantureux, and Gayot's book on virus diseases of domestic animals in Algeria.
6) Five condensed articles.
7) Thirty-seven abstracts, classified.
8) Professional news of the livestock sanitary service in occidental French Africa.

The *Revue* is a quarterly; foreign subscriptions are 650 francs. It is edited by the *Institut de Médecine Vétérinaire Exotique* of Alfort.

Infectious Diseases of Domestic Animals

Maladies Infectieuses des Animaux Domestiques in two volumes by G. Currason, popular French author, is the sort of masterpiece that enriches the literature and penetrates to the four corners of the world, regardless of the language in which it was originally published. No significant infection of farm animals in any part of the world seems to have been overlooked. The diseases are grouped according to the nature or tribe of the infective agent.

Volume I treats exclusively of the ultravirus infections in nine parts subdivided into 38 chapters. Part 1 of this volume is in four chapters discussing, respectively, the diseases called pests (rinderpest, hog cholera, African sleeping sickness, avian pest, and pseudopest—including pneumoencephalitis of Beach and Jungherr, or so-called Newcastle disease); Part 2, in six chapters, groups the epitheliotrophic virus diseases (canine distemper, feline distemper, feline gastroenteritis, infectious leucopenia of cats, avian laryngotracheitis, blue tongue of sheep and cattle) to illustrate the pattern of classification throughout the two volumes. The groupings of Volume II, in seven parts subdivided into 46 chapters, is still more discriminating in grouping microbial agents as to their pathogenic rôle. The Coccaceae, Bacteriaceae, Mycobacteriaceae, Actinomycetaceae, and Spirillaceae, broken down into the familiar genera and species responsible for the livestock infections, bring out a taxonomy that is unique in classical veterinary literature.

The preterist will find these volumes full of fascinating historical information on who's who and when in veterinary medical research—information that gives scholarly status to theses on diseases. Currason, a fluent writer with a background of experience as general inspector of the French colonial veterinary service, is the author of Exotic and Comparative Pathology in three volumes (1942), Comparative and Veterinary Protozoölogy in three volumes (1943), Rinderpest (1935), Diseases of the Camel (1946) (titles trans.), and several other important works in preparation.—[*Maladies Infectieuses des Animaux Domestiques. By G. Currason, Vol. I, 404 pages; Vol. II, 480 pages. Vigot Frères, 23 rue de École de Médecine, Paris 6, France. 1947. Price not given.*]

Dissection of Domestic Animals

"Technique of Dissection of Domestic Animals" (trans.) is a thorough-going treatment of the subject for the teacher and student of anatomy as taught in the modern college of veterinary medicine. The techniques are illustrated and organized in five parts covering horses, ruminants, carnivores, swine, and fowl, in that order, following opening chapters on general considerations as to installation of anatomical laboratories, general equipment, instruments, cooking and macerating utensils, refrigeration, disposal of débris, maintenance and hygiene, methods of killing, dissecting subjects for different purposes, proper evisceration, preservative injections, injection of arteries, veins, and lymphatics, etc.

The pains taken to emphasize the points of incision, penetration, ligation, etc., for the most advantageous study of particular organs and structures likewise emphasize the experience of these well-known anatomists. The book appears to complete the extensive works on veterinary anatomy in four comprehensive volumes by the senior author, longtime teacher of anatomy at Alfort who now heads the teaching of zoölogy at the *Muséum national d'Histoire Naturelle.*—[*Technique de Dissection des Animaux Domestique. By Professors E. Bourdelle, C. Bressou, and P. Florentine. 248 pages. 69 illustrations. J.-B. Bailliere et Fils, 19 rue Hautefeuille, Paris. Price not supplied.*]

The Practice of Veterinary Medicine

This fifth edition contains extensive revisions of some of the sections, particularly those dealing with diseases in the treatment of which the sulfonamide drugs and penicillin are extensively used. Since the preceding edition was published (1943), much progress has been made in the development of new sulfonamide drugs, and in determining the dosage necessary for each species of animal and for each route of administration. All of this information has been incorporated in the text, and it is especially noticeable in the chapters on diseases of the respiratory system, of the digestive system, and of the udder.

As in all previous editions, the book is devoted specifically to the practice of veterinary medicine. It delves into the theory only when this is necessary to clarify the treatment, and then only to the extent necessary to clarify the points in question. For the practising veterinarian, it presents the information desired in a concise and practical style, and with more than 100 carefully selected illustrations. The book is exceptionally well printed on a grade of paper suggestive of prewar quality, and the binding and cover are of equally high grade.—[*The Practice of Veterinary Medicine. Fifth Revised Edition. By D. H. Udall. 751 pages, 108 illustrations, cloth. George Banta Publishing Co., Menasha, Wis. Price not listed.*]

Bonny's Boy, a Dog Story

Here is a gripping story about a black Cocker Spaniel and a boy who raised the orphaned pup in a home-made incubator so successfully that Bonny's Boy won Best of Show at Madison Square Garden. What transpired between the incubator and the Westminster show ring makes the kind of reading that puts you on the forward edge of your chair and keeps you there until the end.

Bonny's Boy was the lone liveborn pup in a litter. The mother, a beloved family pet, died within minutes after she gave birth to him, and young Davy Edwards took it upon himself to hand-raise the pup. As things turned out, Bonny's Boy made a comparable contribution to the raising of Davy.

An important figure in the story is Dr. Mason, the town veterinarian (the author uses the adjective *veterinary* throughout the book for the noun veterinarian) whose professional skill and kindness played a major part in the life of Bonny's Boy.

This book will appeal to youngsters and oldsters alike, as well as to every veterinarian who appreciates a well-paid tribute to his profession.—[*Bonny's Boy. By F. E. Rechnitzer. 266 pages, paper. The John C. Winston Company, Philadelphia. 1946. Price $2.00.*]

Diseases of the Pig

The book is divided into 14 chapters, of which the first five deal with such items as breeds, market types, housing and management, feeding, and dentition and health. The swine diseases are then discussed, but under a classification which is unfamiliar in the United States. For example, they are classed as scheduled diseases, constitutional diseases (nonscheduled), deficiency diseases, local diseases, parasitic diseases, and poisons and poisonous plants.

The scheduled diseases are those which have been scheduled for control and eradication under the acts and orders of the Ministry of Agriculture and Fisheries; the nonscheduled constitutional diseases are the specific infections not localized in the body; the local diseases are those of the digestive, urinary, respiratory, and nervous systems.

Because of this classification, and the fact that the book was written for use in England, it will not lend itself readily to use as a reference work on the library shelf of the American veterinarian. However, a study of this text does broaden the conception of the control of animal diseases. Such study will interest the veterinarian who thinks beyond his immediate practice needs.—[*Diseases of the Pig. Second Edition. By David J. Anthony. 287 pages. 53 illustrations, cloth. Printed in Great Britain. The Williams & Wilkins Co., Baltimore, Md. 1947. Price not listed.*]

Based on hay at $15 a ton, dairy concentrates at $75 a ton, silage at $6 a ton, and labor at 55 cents an hour, the cost of producing 100 lb. of milk is $4.35, or 8.7 cents a quart.—*From Cunningham, N. Y. State Agric. Exper. Sta.*

In 1946, horse racing yielded states and cities $110 million in taxes independent of real estate, amusement, and income taxes.

THE NEWS

Main Events of the 84th Annual Meeting

Netherland Plaza, Cincinnati
August 17-21, 1947

Registration.—Advance registration blanks have been mailed to members having confirmed hotel reservations. When returned by members, the AVMA office prepares registration slips in duplicate, returning one to the registrant. These slips should be presented at the registration desk at the Netherland Plaza. The registrants will then receive their badges, programs, etc., after payment of the $3.00 registration fee.

For those not registered in advance, the registration desk will be open Sunday, August 17, on the third floor, Netherland Plaza, 2:00 p. m. Registration will continue Monday morning, August 18, at 8:30 a. m., and daily thereafter.

Executive Board Sessions.—Sunday, August 17, 9:00 a. m. and 2:00 p. m. Also 7:30 if necessary.

House of Representatives.—First Session, Monday, August 18, 9:00 a. m. Second Session, Monday, August 18, 7:00 p. m. If a third session is required, it will probably be held on Tuesday evening, August 19, at 7 o'clock.

Exhibits (Commercial and Scientific).—North and south exhibit halls off the fourth floor mezzanine; fourth floor corridor and third floor foyer. Open daily, 9:00 a. m. to 5:30 p. m., Monday through Thursday.

Opening Session.—Hall of Mirrors, Monday, August 18, 1:00 p. m.

Nomination of Officers.—Following the Opening Session, Monday p. m.

Women's Auxiliary Luncheon and Annual Meeting.—Gibson Hotel, 12:30 p. m., Tuesday, August 19.

Sitter Service.—The Sinton and Gibson hotels have sitter service available to parents who bring young children to the meeting. The rate is $1.00 per hour. The attendants furnish their own transportation until 10:00 p. m., after which hour the transportation to their homes must be paid by parents.

General Sessions.—Hall of Mirrors. All day Tuesday, August 19, and Wednesday and Thursday mornings at 11 o'clock.

Section Meetings.—Sections on Small Animals, Poultry, and Surgery and Obstetrics, Wednesday and Thursday mornings; Sections on General Practice, Sanitary Science and Food Hygiene, and Research, Wednesday and Thursday afternoons.

Motion Pictures.—Scheduled for showing prior to General Sessions and Section Meetings.

Floor Show and Dance.—Tuesday evening, August 19.

Annual Banquet, President's Reception, and Dance.—Wednesday evening, August 20.

Alumni Luncheons.—Thursday noon, August 21.

(All sessions on Eastern Standard Time.)

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Garage, Parking, and Airport Facilities.—All those who are driving to Cincinnati, and who have confirmed reservations at the listed hotels, can leave their cars with the doormen or garage attendants at their respective hotels.

Ample parking facilities are available within a few blocks of all hotels.

Should any member be flying his private plane to Cincinnati, he may communicate directly with Dr. G. C. Lewis, chairman of the committee on garages, parking, and airports, 7121 Paddock Road, Carthage, Ohio, for information about airport accommodations.

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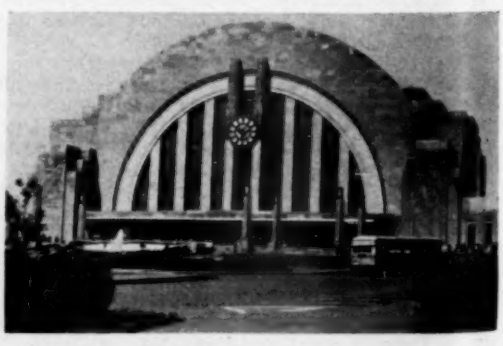
Added Hotel Accommodations.—The Committee on Hotels and Housing will have information at the convention registration desk, third floor of the Netherland Plaza, on motels and other possible rooming facilities for those who did not obtain reservations in advance.

At time of going to press, over 1,900 persons had confirmed reservations for the convention at the listed hotels, and all rooms allocated for the convention by the several hotels had been taken up. This indicates that previous attendance records will be broken.



Union Station, Cincinnati

Dates Set for Poultry Conference

The Institute of American Poultry Industries has set Feb. 1-3, 1948, as the dates for its next Fact Finding Conference to be held in Kansas City, Mo. The main arena in the Municipal Auditorium has been reserved for the exhibits. The conference program will include many informal group sessions, and suggestions concerning problems and topics for discussion will be gratefully received from the industry.

National Dog Week's Century Club

Mr. Harry Miller, executive secretary of National Dog Week, announces that, to date, 15 have joined National Dog Week's Century Club. This group consists of those who have offered to contribute up to $100 this year toward financing the newly established National

Dog Week Research Award. Among the membership, which probably will be limited to 25 a year, are: Capt. Will Judy; H. Schuyler Meritzer; Hon. George H. Earle; C. M. Olson; Dr. Wilfred Funk; Fritz Nuernberg, Daschund Club of America; John J. Jacobsen; German Shepherd Club of America; Diana Thorne; Mrs. H. A. Gogarty; Hildegarde I. Stewart; Leicester Harrison; Mrs. Frank C. Butcher; and W. F. Harrah.

A portfolio of puppy photographs, representing National Dog Week's principal fund-raising project this year, is presented to anyone who contributes a minimum of $5.00. Colorfully designed, it contains a series of original portraits of exceptionally appealing puppies taken by Ylla, internationally known photographer of animals.

Farmers Warned that Floods May Spread Livestock Diseases

Through newspapers and radio, the AVMA has warned livestock owners that some of the most serious animal diseases may surge to new heights this summer in areas hit by floods. Diseases placed high on the danger list are anthrax, anaplasmosis, and equine encephalomyelitis.

The message was carried to nearly 5,000 rural newspapers in the July issue of the AVMA clipsheet, *Animal Health Topics*. A radio script also was prepared on this subject for the August series of state association broadcasts.

Livestock owners in flood areas were urged to consult their veterinarians regarding the advisability of having their animals vaccinated immediately against anthrax and equine encephalomyelitis. They likewise were advised to use every practical means to rid farm premises of flies, mosquitoes, and other biting insects as a step in preventing grave epizoötics.

APPLICATIONS

The listing of applicants conforms to the requirements of the administrative by-laws—Article X, Section 2.

First Listing

BECK, LAWRENCE L.
3539 S. Rockwell St., Chicago, Ill.
D.V.M., Kansas City Veterinary College, 1918.
Vouchers: E. M. Lynn and L. A. Blank.

BROWN, EARL F.
Manilla, Indiana.
D.V.M., Ohio State University, 1938.
Vouchers: D. D. Baker and R. C. Julien.

CARLSON, HERBERT C.
116 Wm. H. Taft Road, Cincinnati 19, Ohio.
D.V.M., Ontario Veterinary College, 1946.
Vouchers: J. L. Jones and M. L. Willen.

CHAVEZ G., CARLOS E.
Peruvian Embassy, Military Attache, 1301 15th St., N. W., Washington 5, D. C.
D.V.M., National Veterinary College, Peru, 1944.
Vouchers: I. E. Newsom and R. F. Bourne.

COWTON, LOUIS V.
3520 S. Rockwell St., Chicago, Ill.
D.V.M., St. Joseph Veterinary College, 1921
Vouchers: E. M. Lynn and L. A. Blank.

FECHNER, HERBERT H.
Syracuse, Neb.
D.V.M., Kansas State College, 1935.
Vouchers: F. Breed and E. C. Jones.

GETTY, WILLIAM A.
Aurora, Mo.
D.V.S., Kansas City Veterinary College, 1910.
Vouchers: A. H. Quin and S. J. Schilling.

HILL, LEONARD J.
3035 South 13th Ave., (So.), Birmingham, Ala.
D.V.M., Alabama Polytechnic Institute, 1917.
Vouchers: E. E. Williams and B. N. Lauderdale.

NILSSON, FRITZ M.
Royal Veterinary College, Stockholm, Sweden.
D.V.M., Royal Veterinary College, 1936.
Vouchers: R. C. Klussendorf and J. D. Ray.

WASHBURN, PAUL M.
21 Portsmouth St., Jackson, Ohio.
D.V.M., Ohio State University, 1939.
Vouchers: W. R. Krill and W. E. Welbourn.

WILEY, JOSEPH A.
4545 Reading St., Cincinnati 29, Ohio.
D.V.M., Ohio State University, 1938.
Vouchers: A. R. Theobald and J. G. Hardenbergh.

Second Listing

Bernard, Paul, Sabina, Ohio.
Brock, Mary E., 222 Mt. Sterling Ave., Flemingsburg, Ky.
Eason, George E., 2342 Johnson City Highway, Kingsport, Tenn.
Gobler, Robert P., P. P. Box 37, Sonoma, Calif.
McDaniel, George T. Jr., Eastman, Ga.
Rosenbusch, Carlos T., San Jose 1481, Buenos Aires, Argentine Rep.
Roshon, Elmer L., Sabina, Ohio.
Solt, John J., Arlington, Ohio.
Weston, Braxton M., Asheboro, N. Car.
Wright, Herschel J., 656 N. Main Street, Dayton, Ohio.
Young, Shou-Shen, c/o Yungtai & Co., 40 E. 34th St., New York, New York.

1947 Graduate Applicants

First Listing

The following are graduates who have recently received veterinary degrees and who have applied for AVMA membership under the provision granted in the Administrative By-Laws to members in good standing of junior chapters. Applications from this year's senior classes not received in time for listing this month will appear in later issues. An asterisk (*) after the name of a school indicates that all of this year's graduates have made application for membership.

Colorado A & M College*

BORTHWICK, NORMAN M., D.V.M.
Bolton Animal Hospital, Albuquerque, N. M.
Vouchers: J. Farquharson and A. W. Deem.
BRASMER, TIMOTHY H., D.V.M.
2733 Garrison Ave., Evanston, Ill.
Vouchers: J. Farquharson and H. W. Johnson.
BRIGGS, JOSEPH L., D.V.M.
944 Michigan Ave., Evanston, Ill.
Vouchers: J. Farquharson and H. W. Johnson.
CALDERWOOD, GEORGE S., D.V.M.
Box 103, Crary, N. Dak.
Vouchers: J. Farquharson and R. Zimdahl.
CARNEY, JOHN R., D.V.M.
Linden Park, Cortez Ave., Prescott, Ariz.
Vouchers: J. Farquharson and H. W. Johnson.
CASCINAI, ALDO P., D.V.M.
32 14th Ave., San Mateo, Calif.
Vouchers: J. Farquharson and H. W. Johnson.
HAWLEY, ROBERT L., D.V.M.
125 W. 10th Street, Astoria, Ore.
Vouchers: R. Zimdahl and R. Jensen.
HYLAND, ALFRED D., D.V.M.
945 Humboldt Parkway, Buffalo, N. Y.
Vouchers: J. Farquharson and H. W. Johnson.
JESSUP, ROGER V., D.V.M.
5431 N. San Fernando Rd., West, Glendale 3, Calif.
Vouchers: J. Farquharson and H. W. Johnson.
JOHNSTON, JOHN H., D.V.M.
La Junta, Colo.
Vouchers: J. Farquharson and H. W. Johnson.
KELLING, RALPH V., D.V.M.
1150 Lincoln Place, Boulder, Colo.
Vouchers: J. Farquharson and H. W. Johns
MCCHESNEY, ALBERT E., D.V.M.
708 Remington, Ft. Collins, Colo.
Vouchers: J. Farquharson and I. E. Newso
MCCLINTOCK, GEORGE E., D.V.M.
485 E. Highland, Sierra Madre, Calif.
Vouchers: H. W. Johnson and I. E. Newso
MABRY, A. J., D.V.M.
Box 124, Plains, Texas.
Vouchers: J. Farquharson and H. W. Johns
POWERS, KENNETH L., D.V.M.
Route 2, Box 11, Colorado Springs, Colo.
Vouchers: J. Farquharson and H. W. Johns
SCHROEDER, ROBERT J., D.V.M.
10923 Sampson Ave., Lynwood, Calif.
Vouchers: R. Zimdahl and R. W. Davis.
SMARTT, JACK W., D.V.M.
Route 2, Box 126, Lamar, Colo.
Vouchers: J. Farquharson and R. M. Stad
SUDDUTH, WILLIAM H., D.V.M.
Walden, Colo.
Vouchers: H. W. Johnson and J. Farquharso
THURMAN, JOE B., D.V.M.
2807 Jefferson Ave., Ogden, Utah.
Vouchers: J. Farquharson and H. W. Johnso
WILSON, JOHN A., D.V.M.
Wyoming Hereford Ranch, Cheyenne, Wyo.
Vouchers: J. Farquharson and I. E. Newso

Iowa State College

ARMSTRONG, F. D., D.V.M.
Remer, Minn.
Vouchers: J. R. Olson and G. R. Fowler.
AUSTIN, VICTOR H., D.V.M.
40 West Santa Clara Blvd., Ventura, Calif.
Vouchers: H. D. Bergman and D. A. Smit
DENIS, VICTOR M., D.V.M.
No. 3 Calle 18 Este Bis, Panama City, Panam
Vouchers: H. D. Bergman and M. A. Emme son.
HOUMES, RICHARD L., D.V.M.
Central City, Iowa.
Vouchers: D. A. Smith and W. H. Chivers.
MCCANN, FRANCIS J., D.V.M.
114 S. Wabash, Kirksville, Mo.
Vouchers: J. R. Olson and G. R. Fowler.
MOYE, JACK, D.V.M.
114 South Wabash, Kirksville, Mo.
Vouchers: J. R. Olson and G. R. Fowler.

Kansas State College*

ALDRICH, EUGENE C., D.V.M.
1530 S. San Diego Blvd., Escondido, Calif.
Vouchers: F. H. Oberst and G. R. Moore.
BIVIN, DALE L., D.V.M.
Route 3, Manhattan, Kan.
Vouchers: G. R. Moore and E. J. Frick.
COHEN, HAROLD K., D.V.M.
820 Laramie, Manhattan, Kan.
Vouchers: R. E. Witter and J. E. Mosier.
COOK, GEORGE R., D.V.M.
O'Neill, Neb.
Vouchers: E. J. Frick and G. R. Moore.
DIETRICH, LEROY E., Jr., D.V.M.
P. O. Box 1116, Wichita, Kan.
Vouchers: J. E. Mosier and R. E. Witter.
EISENBERG, DAVID, D.V.M.
40 Elliot Place, Bronx 52, N. Y.
Vouchers: E. J. Frick and G. R. Moore.

HAIMS, PHILIP, D.V.M.
Box 322, Kansas State College, Manhattan, Kan.
Vouchers: G. R. Moore and E. J. Frick.

HAMMOND, MARY L., D.V.M.
531 S. Whitcomb, Ft. Collins, Colo.
Vouchers: G. R. Moore and E. J. Frick.

HICKNEY, PHYLLIS M., D.V.M.
322 N. 17, Manhattan, Kan.
Vouchers: G. R. Moore and E. J. Frick.

JEWELL, CHARLES K., D.V.M.
38412 Cleveland Road, Elyria, Ohio.
Vouchers: J. E. Mosier and R. E. Witter.

JONES, LLOYD N., D.V.M.
Schuyler, Neb.
Vouchers: G. R. Moore and E. J. Frick.

JORAN, LAWRENCE M., D.V.M.
505 W. 162nd. Street, Washington Heights, New York 32, New York.
Vouchers: W. W. Thompson and G. R. Moore.

KUTZ, JOEL N., D.V.M.
172-90 Highland Ave., Jamaica, N. Y.
Vouchers: E. R. Frank and G. R. Moore.

LAWRENCE, JACOB, D.V.M.
43-11 76th. Street, Elmhurst, N. Y.
Vouchers: F. H. Oberst and G. R. Moore.

MEYER, NORVAN L., D.V.M.
1223 Bluemont Street, Manhattan, Kan.
Vouchers: R. L. Jewell and G. R. Moore.

MIDDLETON, KENNETH B., D.V.M.
1508 Humboldt, Manhattan, Kan.
Vouchers: F. H. Oberst and G. R. Moore.

NOSSOV, GABRIEL, D.V.M.
780 Pelham Parkway, Bronx, N. Y.
Vouchers: E. J. Frick and G. R. Moore.

PRICE, WILLIAM A., D.V.M.
304 E. 15th. Street, Pittsburg, Kan.
Vouchers: G. R. Moore and E. E. Leasure.

ROLLAG, OLE J., D.V.M.
Beaver Creek, Minn.
Vouchers: G. R. Moore and E. E. Leasure.

ROOK, SEYMOUR, D.V.M.
1090 E. New York Ave., Brooklyn 12, N. Y.
Vouchers: E. J. Frick and G. R. Moore.

TAGUE, CARL W., D.V.M.
531 N. Manhattan Ave., Manhattan, Kan.
Vouchers: E. J. Frick and R. E. Witter.

TARRANT, ANSEL B., D.V.M.
1114 Bluemont, Manhattan, Kan.
Vouchers: E. R. Frank and G. R. Moore.

THAYER, CHARLES B., D.V.M.
20 Canal Street, Middletown, N. Y.
Vouchers: E. J. Frick and G. R. Moore.

Texas A & M College

PATTERSON, CAROL M., D.V.M.
General Delivery, Eastland, Texas.
Vouchers: W. W. Armistead and A. A. Lenert.

Washington State College*

BALCH, ROSCOE K., D.V.M.
308 North 4th., Dayton, Wash.
Vouchers: E. E. Wegner and E. C. McCulloch.

BEMIS, CLYDE M., D.V.M.
N 1628 Calispel, Spokane 13, Wash.
Vouchers: E. E. Wegner and R. W. Dougherty.

BENDER JOHN F. JR., D.V.M.
18520 40th. Pl., N. E., Seattle 55, Wash.
Vouchers: E. C. McCulloch and W. J. Ewing.

BUTTON, ROBERT A., D.V.M.
Rt. 6, Box 143AA, Tacoma, Wash.
Vouchers: E. C. McCulloch and R. E. Nichols.

COHN, LELAND, D.V.M.
659 11th. Ave., San Francisco, Calif.
Vouchers: G. H. Conner and D. R. Cordy.

DELNA, DOLLY, D.V.M.
Rt. 6, Box 1019, Phoenix, Ariz.
Vouchers: R. W. Dougherty and H. J. Griffiths.

FORD, ROBERT I., D.V.M.
Box 428, Rt. 1, Enumclaw, Wash.
Vouchers: R. W. Dougherty and G. H. Conner.

FOX, DONALD L., D.V.M.
201 Washington, Pullman, Wash.
Vouchers: J. E. McCoy and E. C. Stone.

GOECKEN, NED V., D.V.M.
50 Clark Drive, San Mateo, Calif.
Vouchers: H. R. Zimet and E. C. McCulloch.

LYDIARD, HARRY L., D.V.M.
Route 2, Box 172, Medford, Ore.
Vouchers: E. E. Wegner and E. C. McCulloch.

LYNCH, PATRICIA J., D.V.M.
935 W. Pedregosa, Santa Barbara, Calif.
Vouchers: H. R. Zimet and R. W. Dougherty.

MABERRY, MATHEW B., D.V.M.
342 E. 54th. Street, Seattle, Wash.
Vouchers: E. C. McCulloch and J. E. McCoy.

RICE, JAMES G., D.V.M.
c/o Dr. C. J. Ferreira, Box 383, Redding, Calif.
Vouchers: R. W. Dougherty and E. C. McCulloch.

RICHTER, ERNEST R., D.V.M.
Rt. 1, Box 970-A Plummer Ave., San Jose, Calif.
Vouchers: H. R. Zimet and G. H. Conner.

RUST, JAY B., JR., D.V.M.
Ellis Vet. Hospital, 2022 E. 4th. Ave., Olympia, Wash.
Vouchers: E. E. Wegner and R. W. Dougherty.

WALLIS, JAY C., D.V.M .
2977 Stoddard, San Bernardino, Calif.
Vouchers: E. E. Wegner and D. R. Cordy.

WERTH, CARL C., D.V.M.
1209 Kamiaken, Pullman, Wash.
Vouchers: E. C. McCulloch and J. E. McCoy.

WHITE, HAL D., D.V.M.
Baker, Ore.
Vouchers: R. E. Nichols and J. E. McCoy.

WOODS, IRENE F., D.V.M.
Box 142, Kinzua, Ore.
Vouchers: E. C. McCulloch and R. E. Nichols.

Second Listing

Alabama Polytechnic Institute

Thompson, Tiny S., D.V.M., 608-24th St., S. W., Birmingham, Ala.

Thorp, Wilton S., D.V.M., 615 W. Main St., Nashville, Ill.

Cornell University

Bailey, Jack W., D.V.M., 1051 Spaight St., Madison, Wis.

Campbell, Donn B., D.V.M., King Street, Chappaqua, N. Y.

Carsley, Malcolm B., D.V.M., 52 Marian Ave., Pittsfield, Mass.

Cooper, Cecil D. Jr., D.V.M., Box 53, Avenal, Calif.

Drazek, Francis J., D.V.M., Star Route, Hagaman, N. Y.
Feldman, Gilbert J., D.V.M., 1535 Ocean Ave., Brooklyn 30, N. Y.
Fish, Richard A., D.V.M., Salt Point, N. Y.
Floyd, J. Mitchell, D.V.M., 321 Dryden Rd., Ithaca, N. Y.
Graves, John H., D.V.M., York Road, Hartsville, Pa.
Hallenbeck, Mary C., D.V.M., Hoffmans, N. Y.
Hecht, Estelle, D.V.M., 123 Highland Pl., Ithaca, N. Y.
Jones, Ruth E., D.V.M., 15 Homestead Ave., Staten Island 2, N. Y.
Kemen, Mathias J., Jr., D.V.M., Franklin, N. Y.
Kendrick, John W., D.V.M., New York State Vet. College, Ithaca, N. Y.
Leahy, John R., D.V.M., 315 College Ave., Ithaca, N. Y.
Mackey, Edwin D., D.V.M., R.D. 1, Locke, N. Y.
Neserke, Edward I., D.V.M., 5506 Magnolia Ave., Baltimore 15, Md.
Newman, Ray C. Jr., D.V.M., 405 College Ave., Ithaca, N. Y.
Ormsbee, Robert W., D.V.M., Stockton, Calif.
Phelps, John L., D.V.M., 138 Linden Ave., Ithaca, N. Y.
Reighley, John H. Jr., D.V.M., 42 Dartmouth St., Valley Stream, L. I., N. Y.
Rhode, Edward A. Jr., D.V.M., R.D. 2, Amsterdam, N. Y.
Robinson, Elmer L., D.V.M., Ballston Spa, N. Y.
Roper, Calvin B., D.V.M., 42-12 201 St., Bayside, L. I., N. Y.
Rost, Robert C., D.V.M., 561 Hillside Ave., Westfield, N. J.
Rubin, Harry, D.V.M., 301 Dryden Road, Ithaca, N. Y.
Safanie, Alvin H., D.V.M., Ancram, N. Y.
Sauter, Robert A., 11 Colonial Road, Bronxville, N. Y.
Schaer, William G. Jr., D.V.M., 200 Willard Way, Ithaca, N. Y.
Schimoler, Louis C., D.V.M., 80 Calla Ave., Floral Park, L. I., N. Y.
Scholtz, Eugene R., D.V.M., New York State Vet. College, Ithaca, N. Y.
Stevens, Alan D., D.V.M., 37 Bowers St., Nashua, N. H.
Taylor, Clark A., D.V.M., Forest Home Drive, Ithaca, N. Y.
Whallon, Jane E., D.V.M., 65 Irving Terrace, Kenmore 17, N. Y.

Iowa State College

Howard, Richard T., D.V.M., Ankeny, Iowa.
Sander, Robert O., D.V.M., Waukon, Iowa.

Texas A & M College

Bucy Charles B., D.V.M., Box 154, Raymondsville, Texas.
Dodd, Doyle W., D.V.M., W. Tex. Animal Disease Research Lab., Marfa, Texas.
Flesher, Ralph H., D.V.M., General Delivery, Vernon, Texas.
Henderson, James B., D.V.M., Burkett Route, Coleman, Texas.
Holbrook, Allie A., D.V.M., 488 College Street, Morehead, Ky.
Jones, Alfred R. Jr., D.V.M., 5200 Orange Road, Port Arthur, Texas.
Schiefelbein, William W., D.V.M., Rt. 9, 362, San Antonio, Texas.
Sousares, Jimmy F. Jr., D.V.M., 337 F Ave., Box 1233, College Station, Texas.
Spreigel, John M. Jr., D.V.M., Box 147, Ara Pass, Texas.
Stone, James L. D.V.M., 2517 Shelby St., D 4, Texas.
Sturkie, Howard N., D.V.M., Gustine, Tex
Walker, Herbert H., D.V.M., Mexia, Texas.
Wardlaw Lawrence B. Jr., D.V.M., P. O. 331, Del Rio, Texas.
Yturria, Frank D., D.V.M., 2012 Palm B Brownsville, Texas.

COMMENCEMENT

Kansas State College

At the commencement exercises of Kansas State College on June 1, 1947, I R. R. Dykstra presented the following c dates for the D.V.M. degree.

Eugene C. Aldrich	Joel N. Kutz
Dale Lafe Bivin	Jacob Lawrence
Harold K. Cohen	Norvan L. Meyer
George R. Cook	Kenneth B. Midd ton
LeRoy E. Dietrich	Gabriel Nossov
David Eisenberg	William A. Price
Philip Haims	Ole J. Rollag
Mary L. Hammond	Seymour Rook
Phyllis M. Hickney	Carl W. Tague
Charles K. Jewell	Ansel B. Tarrant
Lloyd N. Jones	Charles B. Thayer
Lawrence M. Joran	

U. S. GOVERNMENT

Meat Inspection Funds Restored by Se Committee.—Following hearings by the Se Committee on Appropriations, at which dep mental officials and public representatives w heard, the budget item for the Meat Inspec Division, Bureau of Animal Industry, was stored so that the service would be finan by the government instead of by the meat p ers operating under federal supervision, as been proposed by the House of Representat (*see* the July JOURNAL, p. 66 and p. 79). Senate action provided $6,000,000 which been cut from the Agriculture Department propriation bill by the House.

Executive Secretary Hardenbergh appea on behalf of the AVMA at the public hear conducted on June 23, at which time repres atives of the packing industry and livest organizations also urged that federal meat spection be continued under the present set

The agriculture appropriation bill had to to conference to adjust a number of char between the Senate and House versions, the fate of the meat inspection budget not been finally determined at press time.

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Veterinary Personnel Changes.—The foll ing changes in the force of veterinarians the U. S. BAI are reported as of June 9, 19 by Chief B. T. Simms.

TRANSFERS

Robert J. Anderson, Jr., from Fort Worth, Texas, to Mexico City, Mexico.
Mansel O. Barnes, from Olympia, Wash., to Mexico City, Mexico.
James R. Barry, from Waterloo, Iowa, to Edgar, Wis.
Clifford B. Bratager, from Omaha, Neb., to Ottumwa, Iowa.
George S. Carter, from Edgar, Wis., to Billings, Mont.
James W. Connelly, from Sacramento, Calif., to Mexico City, Mexico.
Rafael Cordero from Jackson, Miss., to Mexico City, Mexico.
William M. Dicke, from Sacramento, Calif., to Mexico City, Mexico.
Joseph H. Digranes, from Spencer, Iowa, to Billings, Mont., to Mexico City, Mexico.
Lloyd A. Frazer, from Des Moines, Iowa, to Mexico City, Mexico.
Kenneth H. Fritts, from Pierre, S. Dak., to Mexico City, Mexico.
Frank G. Gillett, from Charleston, W. Va., to Omaha, Neb.
James B. Griffin, from St. Paul to South St. Paul, Minn.
George W. Hess, from Springfield, Ill., to Mexico City, Mexico.
Lenly T. Hopkins, from Jersey City, N. J., to Kansas City, Kan.
Leonard D. Jacobs, from Sioux City, Iowa, to Spencer, Iowa.
Martin Kagan, from New Orleans, La., to Mexico City, Mexico.
John J. Martin, from Ottumwa, Iowa, to Jersey City, N. J.
Fred C. Mau, from Chicago, Ill., to Mexico City, Mexico.
Harry L. Medcraft, from San Francisco, Calif., to Chicago, Ill.
Francis J. Mulhern, from Baltimore, Md., to Mexico City, Mexico.
Charles R. Omer, from Baltimore, Md., to Mexico City, Mexico.
Richard E. Omohundro, from Little Rock, Ark., to Mexico City, Mexico.
Harry E. Schaulis, from Topeka, Kan., to Mexico City, Mexico.
Murray H. Sherber, from Oklahoma City, Okla., to Albany, N. Y.
Louis H. Smith, from Topeka, Kan., to Mexico City, Mexico.

RESIGNED

Robert F. Kieldsen, Butte, Mont.
Albert C. Nagle, Fort Worth, Texas.
Harold Shanzer, Philadelphia, Pa.
Glen W. Stevens, El Paso, Texas.

RETIRED

Amos G. Ferrin, Sioux Falls, S. Dak.

DIED

Mart S. Britten, Columbus, Ohio.
Ladwin D. Shannon, Madison, Wis.

• • •

Dr. G. W. Stiles Retires from BAI.—Dr. George W. Stiles, after forty-five years of service in the U. S. Department of Agriculture, retired from the U. S. BAI on June 30, 1947. He has had charge of the pathological laboratory at Denver, Colo., since 1918.

Dr. Stiles obtained his B.S. degree from Oklahoma A. & M. College in 1900, his M.D. from George Washington University in 1905, and a Ph.D. degree from the same institution in 1909. During his service with the Bureau, he has made special studies of animal diseases transmissible to man—anthrax, brucellosis, tuberculosis, swine erysipelas, and Malta fever in goats; for twenty years, he has conducted investigations on anaplasmosis of cattle. An outstanding authority on these diseases, he is a member of the American Medical Association, the Denver Public Health Council, and author of more than 60 articles on various subjects.

AMONG THE STATES AND PROVINCES

Arkansas

State Board Examinations.—The June issue of the JOURNAL (p. 406) quoted Karr Shannon of the *Arkansas Democrat* to the effect that no examination was required to obtain a license to practise veterinary medicine in Arkansas.

Dr. J. S. Campbell calls attention to the fact that it was a temporary law that now has expired; all applicants for license must now stand examination although the law does not require an applicant to be a graduate to take the examination.

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State Veterinarian's Office.—A report from Dr. J. S. Campbell, state veterinarian, reveals that 25 to 30 head of cattle have died from an anthrax outbreak in Ashley County. State veterinarians have vaccinated 1,500 to 2,000 animals in the area.

The spray-truck program has proved popular, with 27 trucks in operation, each one spraying about 6,000 head per month. Ten cents per head is the charge in this self-supported project. Four pounds of 50 per cent DDT per 100 gal. of water is the strength used, and the average rate of application is 1 gal. per animal.

The state veterinarian's office, with the BAI coöperating, will furnish any graduate veterinarian with brucellosis vaccine for official vaccinations. He must make a record of each animal for the state office and identify the animal by ear tag or tattoo number to constitute an official vaccination.

S/T. D. HENDRICKSON, *Secretary.*

California

Importation of Eggs.—For nine consecutive years preceding 1947, tremendous quantities of eggs were imported into California, formerly a large exporter of eggs to the eastern markets. In 1936, the shipments into the state totaled 1,333,035 cases (30 dozen each), a few less than in 1945 when eggs were shipped to troops in the Pacific area *via* California ports. Of these importations, the Middlewest (Nebraska, Minnesota, Kansas, Iowa) furnished 72 per cent. The western states which once produced 425 eggs per capita produced only 286 per capita in 1946. The fact that population has increased faster than egg production is given as one of the causes of the change.

Sigma Xi Chapter at Davis.—The California-at-Davis Chapter of Sigma Xi was installed on the Davis campus, University of California, in May. President Carl D. Anderson of the National Society installed the officers.

• • •

Revise Milk Code.—After heated arguments from both camps, the state legislature passed the bill that clarifies the milk code in important respects regarding market milk. Controversy arose over restricting counties and municipalities from enforcing stricter regulations on butterfat, solids-not-fat, and pasteurization than the new law provided.—*From Western Dairy Journal.*

• • •

Richiest Farm Counties.—The five richest farming counties in the United States are all in California: Los Angeles, Fresno, Tulare, San Joaquin, Kern.

Connecticut

Dr. George E. Corwin Appointed as Disease Control Veterinarian.—Dr. George E. Corwin, Hartford, who has served for the past sixteen years as deputy commissioner of domestic animals, has been appointed to the newly created position of disease control veterinarian, according to a recent announcement by Commissioner John Christensen of the state Department of Farms and Markets. One of the major projects under Dr. Corwin's direction will be the state program for eradication of bovine brucellosis; he will also assume much of the technical work formerly carried on by Dr. F. Forbes Bushnell of Manchester, who had asked to be relieved of his responsibility in livestock disease control in order to devote more time to his private practice.

Florida

Pharmaceutical Manufacturers Meeting.—The fortieth annual meeting of the American Pharmaceutical Association held at Boca Raton in April brought together America's outstanding drug manufacturers: Squibb, Winthrop, Merck, Ciba, Hoffman-La Roche, American Cyanamid, Penick, Cutter, Norden, Pitman-Moore, Searle, Strasenburgh, Schenley, Noyes, Sutliff & Case, Breon, to name only those best known to the veterinary profession.

A noteworthy event of the meeting was awarding the first annual prize for distinguished research in biology and medicine to Dr. Bernardo Alberto Houssay, an honorary professor of the college of veterinary medicine of Buenos Aires, Argentina.

Georgia

State Association.—The forty-first annual meeting of the Georgia Veterinary Medical Association was held in Albany on July 21-22, 1947. The address of welcome by Hon. Walter R. Brown, secretary of the Albany Chamber of Commerce, was followed by the response by Dr. J. E. Severin and an address from President W. V. Petty. The following speakers contributed to the program:

Dr. T. F. Sellers, Atlanta, Georgia Department of Health: "Proposed Amendments to the Rabies Control Act." Discussions by Drs. E. A. Davis, J. E. Severin, J. T. Riddle, T. C. Ross, Chas. P. Hill, L. C. Rossman, and T. B. Clower.

Dr. James Farquharson, Colorado A. & College, Fort Collins: "Small Animal Surger and motion pictures on "Unusual Hyster tomy on the Bitch," "Brain Surgery on Dog," and "Intestinal Anastomosis."

Dr. B. T. Simms, chief, U. S. BAI, and pre dent of the AVMA: "Coördination of Cons uent Associations with the AVMA," and " ture Plans for Brucellosis Control in U. S.

Dr. H. G. Bailey, City Health Departme Savannah: "The Veterinarian's Relation Public Health." Discussions by Drs. W. D. M tin, Sr., and S. R. Bowen.

Dr. W. J. Gibbons, Alabama Polytechnic stitute, Auburn: "Dairy Cattle Practice." D cussions by Drs. S. F. Stapleton, E. E. Cha bers, William L. Sipple, and J. S. DeRing.

Dr. Paul W. Chapman, dean, College of Ag culture, Athens: "Veterinary Education Georgia."

Dr. G. C. Toliver, Albany: In charge large animal clinic at Union Live Stock Yar

Dr. W. B. Hirleman, Waynesboro: "Demo strations of Large Animal Castration."

Dr. W. J. Gibbons, Auburn, Ala.: "Demo strations of Ovariectomy in Bovine Animal

The master of ceremonies at the banqu session was Dr. W. C. Dendinger, U. S. B Atlanta. Rev. Olin C. Cooper of Bainbrid opened the program, and Hon. M. E. Thompso governor of Georgia, was the speaker of t evening.

s/L. C. ROSSMA

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BCG Test.—The U. S. Public Health Servic in coöperation with local health authoritie has chosen Muskogee County as a communi in which to continue its long range study BCG vaccination of children. Tuberculin te ing of 16,000 children (whites and Negroe was begun in April.—*Science News Letter.*

Illinois

Brucellosis Program Stiffened.—Beginni July 1, the state-wide control of bovine br cellosis will be rigidly enforced according widely published announcements to that effe The three previous plans are reduced to tw test and slaughter and calfhood vaccinatio Superintendent of Animal Industry Fidler e timates that brucellosis is costing Illinois far ers $4 million a year.

• • •

Diagnostic Service.—The veterinary patho ogy laboratory of the University of Illinois r ceives about 4,500 specimens for diagnosis eac month, according to Dr. Robert Graham, dea of the University's new veterinary school. Fee samples and plants suspected of being poiso ous to animals are included in the materi examined.

• • •

First in Hog Production.—Henry County, Il has replaced Cedar County, Iowa, as the n tion's leading hog county, the 1945 census agriculture shows. Henry County had 183,3 swine on farms at the start of 1945, while Ced County had 156,876.

Indiana

Indiana-Illinois Association.—The annu spring meeting and fish fry of the Indian

Illinois Veterinary Medical Association was held in Deming Park, Terre Haute, on June 20. Dr. John Bullard of Purdue University spoke on "Brucellosis in Animals."

s/H. MARVIN BRATT, *Secretary.*

Iowa

Cedar Valley Officers.—At the June 9 meeting of the Cedar Valley Veterinary Association, the following officers were elected: Dr. A. L. McGrath, Jesup, *president*; Dr. A. J. MacIntosh, La Porte City, *vice-president;* and Dr. C. B. Strain, Dunkerton, *secretary-treasurer* (reëlected).

s/C. B. STRAIN, *Secretary.*

• • •

Moranville Joins Vitamineral Sales Force.—Dr. I. W. Moranville (CVC '19), Durant, Iowa, prominent figure of the Eastern Iowa crowd for twenty-eight years, has been chosen as a member of the sales department of the Vitamineral Products Company, of Peoria. Dr. Moranville is an active member of the American, Iowa, and Eastern Iowa associations and a practitioner of the upper echelon.

• • •

Cartoons Talk for Veterinary Science.—A series of six well-prepared cartoons, issued in plate form ready for the printing presses of farm newspapers, is one of the mediums used by the Associated Serum Producers in a spring campaign to tell the public about veterinary contributions to livestock health and human welfare.

Kansas

Avian Pneumoencephalitis.—A minor outbreak of avian pneumoencephalitis was confirmed by laboratory diagnosis recently at the School of Veterinary Medicine, Kansas State College, Manhattan. Up to that time, the state had been considered free of the disease.

Kentucky

Conference for Veterinarians.—The Kentucky Veterinary Medical Association held a conference for veterinarians at the Brown Hotel in Louisville on July 16-17, 1947. President T. J. Stearns introduced the Rev. L. F. Southern of Louisville, who gave the invocation; Dr. Wm. F. Lamb of the Louisville and Jefferson County Health Department delivered the address of welcome, with a response by Dr. A. S. Barnes. The scientific program featured the following speakers:

Dr. W. J. Gibbons, Alabama Polytechnic Institute, Auburn: "Dairy Cattle Practice," and "X Diseases."

Dr. A. S. Barnes, U. S. BAI, Frankfort, "Official Testing for Bovine Brucellosis."

Dr. W. M. Coffee, La Center: "Swine Practice."

Dr. E. L. Taylor, Georgetown: "Veterinary Practice and Sulfonamides."

Mr. Samuel R. Guard, editor of *Breeder's Gazette*, Louisville: "The Place of the Veterinarian in a Progressive Livestock Program and a Change in Veterinary Practice Laws."

President T. J. Stearns led a discussion of the veterinary practice law with the special committee and the entire membership participating.

The ladies auxiliary held meetings on July 16. Mrs. Jos. T. Stearns of LaGrange was acting chairman.

s/CARROLL A. ROLL, *Secretary.*

Massachusetts

The Harvard School of Public Health.—Reorganized and separated administratively from the Harvard Medical School on July 1, 1946, the Harvard School of Public Health is the outgrowth of the department of preventive medicine and hygiene founded in 1909 and of the Harvard-Technology School of Public Health established under the joint management of Harvard University and the Massachusetts Institute of Technology in 1913. The school was made possible by an endowment from the Rockefeller Foundation in 1922.

The course is divided into nine chairs: biostatistics, epidemiology, industrial hygiene, maternal and child health, nutrition, physiology, public health bacteriology, public health practice, and sanitary engineering, each filled by a Harvard professor and administered by Dean James S. Simmons, professor of public health. Advanced students are accepted for training toward the degrees of Master of Public Health and Doctor of Public Health.

Grants-in-aid have been received from American Meat Institute, Swift & Company, National Dairy Council, U. S. Public Health Service, Sugar Research Foundation, Army Research and Development Board, and others.

• • •

Veterinary School at Brandeis (Middlesex) University Discontinued.—The trustees of Brandeis University, formerly Middlesex University, Waltham, announced about July 15 the postponement of plans to engage in professional education for veterinary medicine. This decision was contained in a printed circular which stated that "large, basic expenditures needed to meet AVMA requirements and substantial annual deficits thereafter make it impractical to undertake a veterinary program at this time."

Michigan

State Association Meeting.—The Michigan State Veterinary Medical Association held its sixty-fifth annual meeting at the Hotel Olds in Lansing on June 24-25, 1947. The program consisted of the following speakers:

Dr. T. B. Rice, Indiana University Medical Center, Indianapolis: "Brucellosis in Man and Beast."

Dr. N. B. Tennille, Toledo, Ohio: "Aseptic Surgery," and "Records and Business Methods in Small Animal Practice."

Dr. J. D. Ray, Corn States Serum Co., Omaha, Neb.: "Current Hog Cholera Problems."

Dr. M. A. Emmerson, Iowa State College, Ames: "Roentgen Therapy" (illustrated), and "Bovine Trichomoniasis."

Dr. T. H. Ferguson, Lake Geneva, Wis.: "More Frequent Diseases of Large Animals," and "Emergency and Common Surgery of Farm Animals."

A symposium on "The Actual Value of a Recent Graduate" was composed of Drs. H. J. Benson, S. P. Curell, H. E. Defendorf, A. E. Erickson, L. H. LaFond, and N. B. Stirling.

The banquet speaker was T. B. Rice, M.D.,

of Indianapolis, Ind., who spoke on "Brucellosis as a Public Health Problem."

The attendance was the largest in the association's history—a total of approximately 350.

s/B. J. KILLHAM, *Secretary.*

• • •

Patton Returns from Formosa.—Dr. John W. Patton (TEX '21), East Lansing research worker, has just returned from a tour of duty in the Orient. Eight months of his sojourn were spent in Formosa aiding the Chinese to establish a livestock biological laboratory. Dr. Patton is best known for his work on avitaminosis-B in dogs and avitaminosis-A in dairy cows—for his conclusion that in avitaminoses, like rheumatism of old, there is a lot of diagnosing to do.

Missouri

Kansas City Association.—At the regular meeting held at the Hotel Continental, June 17, "Practice Problems and Their Solution" was discussed by Dr. Joe Knappenberger of Hutchinson, Kan., and Dr. John Haley of the Bower Animal Hospital, Topeka. Data concerning "downers" in cattle were presented by Dr. Knappenberger. Dr. Haley discussed blood urea and plasma nitrogen as factors in prognosis in small animal practice.

s/GAIL B. SMITH, *Secretary.*

Nebraska

Central Association.—The Central Nebraska Veterinary Medical Association met in the Pawnee Hotel at North Platte on June 23. The following program was offered:

Dr. C. Olson and Dr. F. R. Woodring, University of Nebraska, Lincoln: "Diseases of Poultry" (with film).

Dr. K. J. Peterson, Colorado A. & M. College, Fort Collins: "Listerellosis in Feedlot Cattle."

Dr. D. R. Mackey, Greeley, Colo.: "Report on AAHA Meeting in Tulsa."

The new meat inspection law and and the Nebraska brucellosis program were discussed. Dr. Anderson of the Nebraska BAI reported on foot-and-mouth disease in Mexico.

The following 1946 officers will continue to serve during 1947: Dr. S. B. Stafford, *president*; Dr. E. Von Tour, *vice-president;* and Dr. L. J. Boulin, *secretary-treasurer.*

s/S. B. STAFFORD.

New Jersey

Animal Quarantine Portrayed.—Farm Service *News*, official publication of the New Jersey Department of Agriculture, devoted a large share of its May, 1947, issue to a picture story of veterinary activities at the Athenia (USDA) animal quarantine station in Clifton. The article shows Drs. Truman W. Cole, director of the station, and G. M. Breed inspecting a shipment of 185 cattle from the Isle of Jersey. Brucellosis and tuberculosis testing are routine, notwithstanding that no Jersey importation has ever been found to have either of these diseases.

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Personal.—Dr. Wilfred F. Harrison (AMER '87) of Lambertville has recently marked the anniversary of sixty years' service as a veterinarian. The New Brunswick-born practitioner was appointed in 1931 by the late J. H. McNeil, former chief of the U. S. BAI, make appraisals of cattle in Sussex County bovine tuberculosis on the area basis. A me ber of the State Board of Veterinary Medi Examiners since 1923, Dr. Harrison is also past president of the New Jersey state assoc tion.

New York

Southern Tier Association.—The Southe Tier Veterinary Medical Association held luncheon meeting on June 25 at Holiday I Vestal, N. Y. The program opened with motion picture, "A Challenge to the New Yo State Dairymen." A staff member of the tension division of the New York State Ag cultural College answered questions on dairyman's problems.

Dr. Charles E. Fletcher, New York City, d cussed small animal practice problems.

The experts who participated in the que tion box hour were: Drs. I. G. Howe and Stone of Albany; Drs. H. G. Hodges, J. M. Mu phy, and S. A. Johnson of the mastitis contr group; and Drs. Peter Olafson and C. G. Ric ard, practising pathologists. Prizes we awarded for the best questions submitted.

s/DONALD W. BAKER, *Secretar*

North Carolina

State Association.—The North Carolina Sta Veterinary Medical Association, in conjunctio with the South Carolina Association of Vete narians, held its forty-sixth annual meeting the Hotel Charlotte, at Charlotte, June 25-2 1947. Two hundred and twenty-five veterinar ans and their wives attended. The scientif program consisted of the following:

Dr. C. P. Zepp, New York City: "Ear Di eases of the Dog and Their Treatment," "Di temperoid Virus," and "Problem Cases Encou tered in Routine Practice."

Dr. C. E. Dee, Miami, Fla.: "Sulfonamid Therapy in Large Animals."

Dr. W. O. Keefer, Springfield, Ohio; "Ma titis."

Dr. C. W. Young, Mocksville: "Problems Practice."

Dr. W. J. Gibbons, Alabama Polytechnic In stitute, Auburn: "X-Disease of Cattle."

Dr. Hal. J. Rollins, Rockingham: "My Ex perience with Rabies."

Dr. W. O. Keefer, Columbus, Ohio: "Practic Pointers."

Other speakers were Dr. E. F. Boyette, pres dent of the North Carolina state association the Rev. Roy Bell, Charlotte; Mayor Herbert H Baxter, Charlotte; Dr. J. G. Gibson, presiden of the South Carolina Association of Veterina ians; and Dr. D. W. Daniels, banquet speake Clemson College, Clemson, S. C. Dr. J. C. Bat man of Greenville was toastmaster.

The following officers were elected: Dr. G. Monroe, *president;* Dr. F. B. Coates, *president elect;* Dr. J. W. McKee, *vice-president;* Dr. H. Brown, *secretary-treasurer*, and Dr. R. Huffman, *executive committee member.*

s/J. H. BROWN, *Resident Secretary*

North Dakota

State Association.—The North Dakota Vet

erinary Medical Association held its meeting in the new Dacotah Hotel at Grand Forks on June 9 and 10. The following program was presented:

Dr. C. S. Bryan, Michigan State College, East Lansing: "Mastitis," and "Large Animal Problems."

Dr. Walter R. Krill, The Ohio State University, Columbus: "Obstetrical Problems," and "The Challenge to Our Veterinary Profession."

Dr. D. F. Eveleth, North Dakota Agricultural College, Fargo: "Anthelmintics."

Mr. D. W. Bolin, Fargo: "Vitamins, Minerals, and Proteins in Animal Nutrition."

Dr. F. M. Bolin, Fargo: "Newcastle Disease."

Dr. Frederick Low, Bismarck: "Battling Brucellosis," and "Meats with Approval" (motion pictures).

Dr. T. O. Brandenburg, State Livestock Sanitary Board, Bismarck: "Diseases of Cattle." Discussion with Drs. W. R. Krill and C. S. Bryan.

Dr. J. W. Robinson was master of ceremonies at the banquet session.

The new officers for the coming year are: Dr. M. R. Benson, *president*; Dr. J. O. Einerson, *vice-president*; and Dr. F. M. Bolin, *secretary-treasurer*.

s/T. O. BRANDENBURG, *Resident State Secretary.*

Ohio

Junior Association.—The May 21 meeting of the junior AVMA at The Ohio State University featured Dr. R. C. Klussendorf, assistant executive secretary of the AVMA and associate editor of the JOURNAL, as speaker of the evening. Dr. Klussendorf outlined the work of the senior AVMA, especially during the war years, stressed the importance of diagnosis, and gave excellent advice to the future veterinarians.

Dr. Walter R. Krill announced that the first and second awards in the essay contest on "Ethics in Veterinary Medicine" went to two freshmen in the Veterinary College.

s/CHARLES TITKEMEYER, *Secretary.*

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Death of Charley Valentine.—The death of Charley Valentine, 79, at Grove City (suburb of Columbus) in May, removes one of the last great horse breakers of fifty years ago. "Valley," as he was affectionately called, traveled the country with the celebrated "Professor" Gleason demonstrating horse breaking and training to large audiences for many years, reaching the height of their popularity in the 1890's. Valentine's skill in schooling unbroken horses was turned to good use when he became a trainer of trotters and won fame in the handling of "bad ones" which less resourceful trainers gave up as hopeless outlaws. Gleason and Valentine conquered the unruly by kindness.

Oklahoma

Division of Veterinary Medicine.—The Oklahoma A. & M. College at Stillwater announces the establishment of a new division of veterinary medicine. Dr. C. H. McElroy, bacteriologist and veteran faculty member, has been named dean of the school. This center serving the Southwest will cost approximately $1,500,000. Some 274 applications for admission to the school are already on file.—*Holstein-Friesian World, June 7, 1947.*

Pennsylvania

Personal.—Dr. W. T. S. Thorp, professor of animal pathology at Pennsylvania State College, has been appointed to the staff of the National Institute of Health, Bethesda, Md., to head a veterinary section in the Pathology Division. Dr. Thorp started this work on June 1.

Tennessee

Eastern Veterinarians Meet.—Dr. W. L. Pinckard of Cleveland, Tenn., was host to the East Tennessee Veterinary Association on June 7 for a barbecue and clinic at his new home and hospital. Eighteen veterinarians and their families were entertained. The clinic consisted of the following demonstrations:

Dr. E. E. Chambers, Rossville, Ga.: "Sterility and Breeding Troubles of Both Dairy and Beef Breeding Animals."

Dr. F. P. Wolfe, Knoxville: "Reduction of Umbilical Hernia in the Horse."

Dr. Dennis Sykes, University of Tennessee, Knoxville: "Diagnosis and Treatment of Mastitis."

Dr. S. B. Isbell, Morristown: "Reduction of Scrotal Hernia in Swine," and "Rabies."

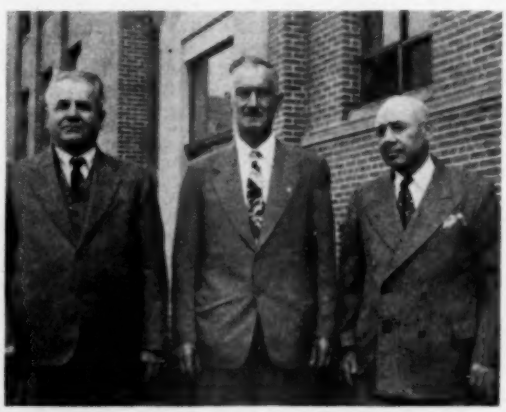
s/M. L. FARRIS, *Secretary.*

Texas

Food Technology Courses.—The A. & M. College, beginning in the fall of this year, will conduct courses for the training of food technologists. Five-year courses will be offered on the science, engineering, and business of food technology. Students may major in horticulture, meats, dairy, fish, cereal, or vegetable-oil products.

Washington

State Veterinary Examining Board.—Three outstanding citizens of the state comprise the Washington State Veterinary Examining Board.



Dr. Menig (left), Dr. MacKintosh, and Dr. Trippeer.

Dr. Peter MacKintosh (MCK '16) of Yakima has served continuously on the Board for twenty-five years, as has Dr. H. A. Trippeer (MCK '07) of Walla Walla, supervisor of dairy and livestock for the State of Washington. Dr. Otto Menig (WASH '04), Four Lakes, former professor of veterinary medicine at the State College of Washington, has served on the Board for eight years. Dr. MacKintosh's son, Roderick, is a veterinarian in practice with his father, and two sons of Dr. Menig, Bert A. and Richard O., hold veterinary degrees.

Wisconsin

Southeastern Association.—Dr. C. A. Brandly, professor of veterinary science at the University of Wisconsin, spoke on "Immunity in Virus Diseases" at the July 17 meeting of the Southeastern Wisconsin Veterinary Medical Association, held at West Bend.

s/J. O. McCoy, *Secretary.*

Wyoming

State Association.—The twelfth annual meeting of the Wyoming Veterinary Medical Association was held in Casper on June 22-23, 1947. Veterinarians participating in the scientific program were: Drs. Rue Jensen, Colorado A. & M. College, Fort Collins; H. E. Kingman, Wyoming Hereford Ranch; Frank Breed, Norden Laboratories, Lincoln, Neb.; J. F. Ryff, University of Wyoming, Laramie; Ralph Honess, University of Wyoming; Wm. A. Goodfellow; Charles Mitchel; Pete Madsen; James Engglish; and J. B. Fuller.

The officers for the coming year are: Dr. Reuben Blackner, *president;* Dr. J. F. Ryff, *vice-president;* and Dr. O. E. Bunnell, *secretary-treasurer.*

s/O. E. Bunnell, *Secretary.*

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New Diagnostic and Research Laboratory for Livestock Diseases.—The Wyoming legislature at their last session passed an appropriation for $75,000 for the establishment and maintenance for the biennium of a laboratory to investigate diseases of livestock. The new laboratory, working in coöperation with the University of Wyoming, will be established at Laramie. While part of its function will be diagnostic in nature, it is planned that research into livestock diseases, especially those peculiar to range management of cattle and sheep, will be attempted. Dr. J. F. Ryff has resigned from the Department of Veterinary Science, University of Wyoming, to head the laboratory which will work under the supervision of the state Livestock and Sanitary Board. Present plans are to engage two additional veterinarians as well as laboratory personnel.

One of the veterinarians will be engaged primarily in diagnostic work, the other in research. Any veterinarians interested in working with the laboratory should write to Dr. G. H. Good, State Veterinarian, State Capitol, Cheyenne.

The number of horses on farms at present is the lowest since 1867, according to the USDA. The number is 7,251,000 compared with 13,742,000 in 1930.

FOREIGN

Africa

E. G. White Heads Veterinary Institute.—win G. White, M.R.C.V.S., well-known Brit veterinary educator, has been named direc of the recently established East African Vet nary Research Institute at Kabete, Kenya C ony. He will take up his post some time August.

The Institute will serve as the center veterinary research in East Africa. It also w help to train African veterinarians and Eu pean veterinary graduates who join the Brit colonial service in East Africa.

Australia

Inadequate Rural Veterinary Service.—In gions where the density of the animal popu tion is great, veterinarians find little difficu in earning a satisfactory livelihood and th are able to serve the community efficiently. T same is true of those who are located in t principal cities. There are rural districts, ho ever, where the conditions are such that it virtually impossible for a veterinarian to ma tain himself with the status and security wh his education and training entitle him to pect. It seems inevitable that the stockown in these less favored regions will wait in va for veterinary service unless the responsibil for their provision is assumed either by so governmental body or other organization.—T *Australian Veterinary Journal, April, 1947.*

The Nova Scotia, Saskatchewan, and N Zealand plans, all of different pattern but turn to the same ends, are discussed.

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The Wool Tariff.—Contrary to what the m in-the-street might expect, the high tariff wool imported into the U.S.A. is not opposed Australian sheep growers. The various as ciations concerned favor movements that w stimulate wool production in America whe so much has been done in recent years to crease the demand for wool fabrics. Quoti from an outstanding Australian wool authori "Dominion wool growers are not really han capped by the (American) import duty."

Canada

Health Regulations on Entry of U. S. Dogs A dominion order dated Apr. 28, 1947, requi that dogs being brought into Canada from t United States must either have a rabies vac nation certificate or be certified by the U.S. B as having come directly from an area that h been free of rabies for six months. The ord does not apply to "performing dogs enteri Canada for temporary stay and kept under rect control," nor does it apply to dogs whi are taken through the country "without t necessary stopovers and . . . not allowed come in contact with Canadian dogs en rout

Denmark

Eighth World's Poultry Congress.—W. D. T mohlen of the USDA, while traveling abroad behalf of the poultry industry, was invited the Danish government to visit Copenhagen f consultation on matters pertaining to t World's Poultry Congress which is scheduled be held in that city in August, 1948.

England

New Army Veterinary Chief.—Brigadier J. J. Plunkett became director of Army Veterinary and Remount Services on March 1, 1947, following the retirement of Brig. G. A. Kelly. Brigadier Plunkett joined the army veterinary service in August, 1914, following graduation from the Royal (Dick) Veterinary College at Edinburgh.

Korea

Rinderpest Campaign.—Dr. Benjamin D. Blood, chief advisor, Bureau of Veterinary Affairs, USMG, Korea, writes: "We are continually faced here in South Korea with the possibility of the entrance of rinderpest from the north. So far, we have been successful in preventing its entrance by maintaining an 'immune belt,' 25 miles wide, along the 38th parallel. Immunity is established by annual inoculation with virus and immune serum . . . and occasional supplemental use of vaccine (toluolized tissue vaccine). The biologics we use are all produced here in Korea at the National Institute for Veterinary Research, Pusan, using the same methods previously developed and under Japanese direction.

"There are several disadvantages to the methods we are now using, the most important being the cost and the danger. The price of cattle is so inflated that serum and vaccine production costs are unreasonably high. Then, too, there is a definite hazard in using live rinderpest virus in the field. It is our hope that we can eventually go into the production of chicken embryo rinderpest vaccine."

STATE BOARD EXAMINATIONS

Louisiana—Louisiana State Board of Veterinary Medical Examiners will hold an examination on August 6, 1947, at the State Capitol, Baton Rouge, La. Address inquiries to Dr. Arthur Goodwin, secretary of the board, New Iberia, La.

West Virginia—West Virginia Veterinary Board will hold an examination on August 11, 1947, 9:00 a.m., Hotel Gore, Clarksburg, W. Va. Secretary must receive applications at least ten days prior to date of examination. Applications accepted only from graduates of schools accredited by the AVMA. Address inquiries to Dr. William E. Trussell, secretary of the board, Charles Town, Jefferson County, W. Va.

COMING MEETINGS

American Women's Veterinary Medical Association. Netherland Plaza Hotel, Cincinnati, Ohio, Aug. 18, 1947. Lucille S. Dimmerling, 1060 Dresden Ave., East Liverpool, Ohio, acting secretary.

American Veterinary Medical Association, Eighty-fourth Annual Session, Netherland Plaza Hotel, Cincinnati, Ohio, Aug. 18-21, 1947. J. G. Hardenbergh, American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

American Animal Hospital Association. Semi-annual business meeting and luncheon. Netherland Plaza Hotel, Cincinnati, Ohio, Aug. 20, 1947. R. E. Ruggles, P. O. Box 303, Moline, Ill., secretary.

Alabama Polytechnic Institute. Annual Conference for Veterinarians. Alabama Polytechnic Institute, Auburn, Sept. 4-6, 1947. R. S. Sugg, College of Veterinary Medicine, Alabama Polytechnic Institute, dean.

University of Georgia. Annual Short Course for Veterinarians. Georgia Coastal Plain Experiment Station, Tifton, Ga., Sept. 23-24, 1947. William L. Sippel, Dept. of Animal Diseases, Georgia Coastal Plain Experiment Station, head.

Purdue University. Annual Short Course for Veterinarians, Purdue University, Lafayette, Ind., Oct. 1-3, 1947. C. R. Donham, Dept. of Veterinary Science, Purdue University, head.

American Public Health Association. Atlantic City, N. J., Oct. 6-10, 1947. Reginald M. Atwater, 1790 Broadway, New York, N. Y., executive secretary.

West Virginia Veterinary Medical Association. Kanawha Hotel, Charleston, W. Va., Oct. 13-14, 1947. R. M. Johnson, 710 Red Oak St., Charleston 2, W. Va., secretary-treasurer.

Eastern Iowa Veterinary Association, Inc. Hotel Montrose, Cedar Rapids, Iowa, Oct. 14-15, 1947. Laurence P. Scott, P. O. Box 325, Waterloo, Iowa, secretary.

Pennsylvania State Veterinary Medical Association Penn Harris, Harrisburg, Pa., Oct. 15-17, 1947. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Florida State Veterinary Medical Association. Bennett Hotel, St. Augustine, Fla., Oct. 27-28, 1947. V. L. Bruns, Box 623, Williston, Fla., secretary-treasurer.

University of Minnesota. Annual Short Course for Veterinarians. University Farm, St. Paul 8, Minn., Oct. 29-30, 1947. W. L. Boyd, Division of Veterinary Medicine, University Farm, chief.

Southern Veterinary Medical Association. Roosevelt Hotel, New Orleans, La., Nov. 17-19, 1947. A. A. Husman, 320 Agricultural Bldg., Raleigh, N. Car., secretary.

Chicago Veterinary Medical Association. Palmer House, Chicago, Ill., the second Tuesday of each month. Robert C. Glover, 1021 Davis St., Evanston, Ill., secretary.

Keystone Veterinary Medical Association. School of Veterinary Medicine, University of Pennsylvania, Philadelphia, Pa., the fourth Wednesday of each month. Raymond C. Snyder, N. W. Cor. Walnut St. and Copley Rd., Upper Darby, Pa., secretary.

Massachusetts Veterinary Association. Hotel Statler, Boston, Mass., the fourth Wednesday of each month. E. A. Woelffer, c/o H. P. Hood & Sons, Boston, Mass., secretary-treasurer.

New York City Veterinary Medical Association. Hotel Pennsylvania, New York, N. Y., the first Wednesday of each month. C. B. Schroeder, Lederle Laboratories, Inc., Pearl River, N. Y., secretary.

Saint Louis District Meetings. Roosevelt Hotel, St. Louis, Mo., the first Friday of February, April, June and November. W. C.

Schofield, Dept. of Animal Pathology, Ralston-Purina Co., St. Louis 2, Mo., secretary.

Houston Veterinary Medical Association. Houston, Tex., the first Thursday of each month. Edward Lepon, Houston, Tex., secretary-treasurer.

MARRIAGES

Dr. E. R. Laiho (MSC '42), 6521 S. Harvard, Chicago 49, Ill., to Miss Shirley Nyssen, June 7, 1947.

Dr. Al Sutton (API '45), 211 4th St., Augusta, Ga., to Miss Betty Ruth Hardy, Augusta, Ga.

BIRTHS

To Dr. (WASH '44) and Mrs. Richard S. Dubigk, 516 E. First St., Port Angeles, Wash., a daughter, Gay Lorraine, April 22, 1947.

To Dr. (ONT '45) and Mrs. Lewis L. Smith, 119 S. Second Ave., Mechanicville, N. Y., a son, Erik Lewis, April 25, 1947.

To Dr. (OSU '43) and Mrs. Harold D. Jacobs, Jr., 1721 Emerson Ave., Apt. 4, Dayton 6, Ohio, a daughter, Donna Lee, May 13, 1947.

To Dr. (CORN '42) and Mrs. Frederick B. Puiling, Jr., Box 608, Atascadero, Calif., a daughter, Kathleen Ann, June 19, 1947.

To Dr. (UP '47) and Mrs. Russell A. Nelson, Box 201, Oakdale, Calif., a son, Richard Colt, June 23, 1947.

VETERINARY MILITARY SERVICE

Separation Eligibility for Veterinary Officers Reduced to 24 Months' Service

Effective July 1, 1947, a change was made in the separation criteria for officers of the Medical Department of the Army, setting the prescribed length of service at twenty-four months for the Medical, Dental, and Veterinary Corps, the Sanitary Corps, and Medical Department Dietitians. The War Department announcement stated that all medical department officers, upon becoming eligible for relief from active duty, should be separated so that their period of terminal leave would be included in their period of service. It was also provided that the prescribed length of service for medical, dental and veterinary officers who had participated in ASTP must be in an active commissioned status.

Prior to the recently announced policy, the service requirement for veterinary officers was thirty-two months, including their period of terminal leave.

Status of Army-Navy Promotion Bill, HR-3830

Following extended hearings by its personnel subcommittee, the House Committee on Armed Services finally combined its promotion legislation into one bill, HR-3830. This bill, over 300 pages long, contains the provisions for officer personnel of the Army and Navy and, at time of going to press, was before the Senate Committee on Armed Services which began its hearings during the week of July 14.

As a result of the House hearings (*see* JOURNAL, July, 1947, p. 87), veterinary rep sentatives were successful in obtaining cor tion of only one of the objectionable featu in the proposed legislation as outlined in May JOURNAL (pp. 340-341). The House adop the recommendation that the Veterinary Co be allowed a general officer but did not c rect the more serious objection, namely, requirement that veterinary officers enter Service as second lieutenants. At the Ho hearings on May 16, AVMA representati W. A. Hagan and J. G. Hardenbergh, also C gressman Gillie, had emphasized the need removing this undesirable provision if the Ar is to obtain the calibre of veterinary gradua needed for its veterinary service. At the sa time, Col. James A. McCallam, chief of Veterinary Division, SGO, expressed strong position to this discriminatory feature of Army bill and asked that initial appointme in the Veterinary Corps be in the grade of f lieutenant, as they have been since 1935. Ho ever, the personnel subcommittee was app ently influenced by the War Departmen mathematical analysis of service credits physicians, dentists, and veterinarians, a failed to give the three-year credit asked veterinarians because the minimum standa for entrance to accredited veterinary colleg is only one year of pre-veterinary training.

DEATHS

★**Ray Gilliam** (WASH '18), 57, Hillsbo Ore., died June 13, 1947, in Portland. Dr. liam served in the Veterinary Corps in Wo War I. He had practised for many years Oakdale, Wash., and at Port Angeles un 1945 when he retired to engage in farming Hillsboro. He was a past president of Washington state association and was mitted to the AVMA in 1919.

★**Charles W. Humphrey** (GEO WASH '1 66, Nutley, N. J., died June 5, 1947. Dr. Hu phrey had retired from the U. S. BAI two yea ago, after thirty-five years of service. He co ducted a small practice in Nutley and was visory veterinarian at the Diamond-P She Farm in Blairstown for two years. He was honorary president of the federal BAI, a me ber of the New Jersey state association, a a member of the AVMA since 1919.

★**Will R. O'Neal** (KCVC '04), Long Beac Calif., died Jan. 28, 1947, following a long ness. Born in Iowa, he moved to Nebraska a boy and started in practice at Lyons follo ing his graduation. In Wayne, Neb., he w appointed assistant state veterinarian, a po tion which he held until he moved to Ca fornia in 1910. He was in charge of the qua antine on the west side of the San Joaqu River during the foot-and-mouth disease ou break of 1924 and was government meat spector for Stanislaus County, Calif., for sever years prior to his retirement. Dr. O'Neal h been a member of the AVMA since 1907.

★**Henri-Pierre Vallée** (ALF), 73, Dijon (Cô d'Or), France, honorary member of the AVM died March 12, 1947. A complete obituary a pears in the Editorial Section of this JOURNA

★Indicates member of the AVMA.

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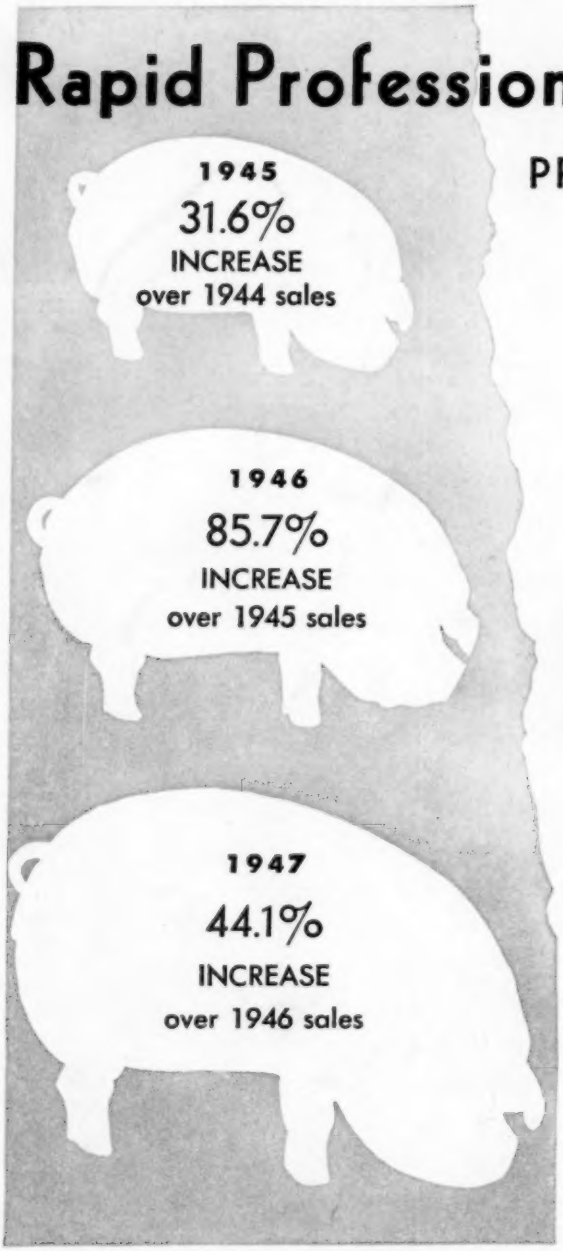

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